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[OFFICIAL NOTICE.]

Western Gas Association.

SECRETARY'S OFFICE, QUINCY, ILL., March 25, 1887.

As previously announced in these columns, the Tenth Annual Meeting of the Western Gas Association will be held at St. Louis, Mo., on the 11th, 12th and 13th days of May. The rates at the Southern, fixed upon as the headquarters of the Association, will be $3 and $3.50 per day,

It is the especial desire of our President and Executive Board, as well as our members, not to mention the Secretary, that this coming meeting, which will be our decennial, shall surpass in every way any of its predecessors. It is fitting that this should be the case, for it must not be forgotten that to St. Louis belongs the honor of giving birth to the Western Gas Association, an Association ranking the second of its kind in size and importance in America. Let those of our older members who are fond of indulging in retrospect, look back, through the years that have flown, to the initial meeting of our Association, held in the office of the St. Louis Gas Light Company, on the 19th day of September, 1878. At that sparsely attended gathering were present the following executive officials of gas companies: J. O. King, who may justly be entitled the Father of the Western Gas Association; Lee A. Hall, Wm. Wallace, Wm. Dunbar, Geo. B. Burns, Ed. J. King, C. A. Lockwood, J. W. Butman, L. C. Jennings, T. G. Lansden, Chas. Erskine, Z. E. Powell, John Atkinson, J. C. Zabriskie, the irrepressible Moran from the wilds of Joliet, and the writer—just sixteen in all— and a hard pull it was to get even that number together. We didn't set the world on fire at that particular meeting, if I remember rightly, but nevertheless from that little nucleus of an organization has sprung the Western Giant, which proposes to celebrate its ten years of vigorous growth and proud manhood in right royal style during the fast approaching merry month of May. Let us all unite, from North, South, East and West, in rising to the importance of the occasion and make our Tenth Annual a "boomer."

In the admirable address of ex-President Wood to the members of the American Gas Light Association, at the Philadelphia meeting, appear some remarks so pointed and forceful, and, if followed out, so conducive to the best interests of our own Association, that they will well bear careful perusal. The portion of the address to which I wish to call your particular attention will be found on page 264, issue of the AM. GAS LIGHT JOURNAL bearing date of Nov. 2, 1886.

I wish to call the particular attention of our members to the clause in Mr. Wood's address which relates to the appointment, by the Executive Committee, of a certain number whose duty it shall be to prepare and present essays for our consideration. I may be departing from my proper routine of duty in urging this matter at the present time; but to me it seems of such paramount and growing importance that I trust I may be excused for dwelling upon the point. No one, unless he has had some experience in this field, can have any clear idea of the labor involved, under our present method, of securing say eight or ten papers for presentation at one of our annual meetings. It seems at times impossible to obtain even that number; while for a two days' business session we should have at least a dozen essays. So far, although I admit that it is early in the day for complete returns, in response to upward of ninety requests I have received but two favorable replies. If anyone has doubts as to the successful working of the plan proposed by ex-President Wood, let him look at the magnificent array of papers announced by Secretary Butterworth in the JOURNAL of March 2d,

to be read before the Ohio Gas Light Association. It seems to me that such proof as this should convince the most skeptical.

From inquiries already made it is evident that our membership will receive material accessions at our St. Louis meeting. Blank forms of application will be mailed to those who desire to join our Association, if they will give notice of their intention to the undersigned.

A. W. Littleton, Secretary.

THE DAYTON MEETING OF THE OHIO ASSOCIATION.

When those who primarily urged the formation of an association of gas engineers for the State of Ohio, and broached the subject to those with whom they came in contact in an inquiring sort of way, some were inclined to doubt whether a fair measure of success would attend the project. Knowing full well that the seed must be planted ere the crop can be reaped, the sowers proceeded with their task, and the result is a broad field well covered with standing grain. Indeed, this lusty growth is little short of surprising, and furnishes us with abundant proof that the "Ohio idea," no matter what direction it takes, can be depended on not to fall by the wayside and be trodden under foot. However, the Ohio Association has steadily prospered and progressed, and the Dayton meeting of last March shows the important part that the Society is likely to play in future in the history of the gas business of this country. Matters discussed at its gatherings are handled from a thoroughly independent standpoint. And those who are opposed to a certain line of action, even if that divergence would appear to place them in direct antagonism to others of their fellows, have no hesitancy in placing themselves squarely on the record.

The Beckel House parlor (selected as the assembly room) on the afternoon of March 16 looked as if its capacity were to be thoroughly tested; and subsequent developments proved that to be the case. In passing, it may be said that the selected spot gave every satisfaction in respect to convenience and facility for enabling everyone to hear what was said and read. As in the current issue of the Journal we give the usual preliminary report of routine business, we need only hastily refer to the excellent attendance and the large accession made to the membership list, which last reminds us that the names of four "tried men, and true," were added to the roster of honorary membership.

Coming now to the President's address, its contents were such as we might look for from the character of the speaker—sharp and to the point; although we did hope that President McMillin would have elaborated more on the matter of electric light. Nevertheless, perhaps the expectation could hardly be justified, for, let an engineer be ever so progressive, prudence must always be considered as the best possible aid to true progress, and off-handed assertions often lead to unpleasant predicaments. While the address is well punctuated with salient points, two of its features strike us as exceptionally worthy of comment. In the first place, we are surprised that the managers of the gas companies of Ohio should have been so apathetic in the matter of the movement for a State Gas Commission. That only 50 per cent. of the total number found it worth while to reply at all to the inquiries of Secretary Butterworth seems strange, and especially so when it is seen that of those replying 75 per cent. unconditionally favored the plan outlined by General Hickenlooper. Perhaps Mr. Gemuender's paper furnishes a clue to the silence of the non-committal 50 per cent., for that gentleman makes out a pretty bad case regarding the status of Ohio's legislators—both State and local. If one is better off at the hands of local boards than when in the custody of the representatives of the State-at-large, what can be expected from either? Coming to Mr. McMillin's other reference to State protection of gas interests, we find him, as usual, open to conviction from testimony presented. To make this plain we introduce here the following paragraph of his annual address: "I have read the annual report of the Massachusetts Gas Commission for 1886, with interest and profit; and while I agree with my worthy predecessor [Gen. Hickenlooper] that in return for a submission of our business to agents of the public the gas companies ought to have direct and positive protection against raiders and blackmailers, yet I do further believe that a State Commission, such as Massachusetts now has, does, in a measure, protect companies against this class of despoilers." It is reassuring to see that the foremost men of the fraternity are watching the operation of this plan with keen eyes; and we repeat what we have consistently contended for. The fraternity not only must guard itself against those who would seek to divide its possessions, but it must also be prepared to resist the insidious encroachments of others who aim at centralization of the business, whether by purchase or otherwise—unless, indeed, the present owners at some time in the future decide to appease their appetites by taking a slice from the loaf which they are about to hand over to the new comers.

Coming to the papers that were read at the Dayton assemblage, no one can find fault with their contents or their diversity. Mr. Wood, of Sandusky, in the discussion that followed his paper on "Gas with Electricity," gave the most substantial reasons for his decided views in the premises; and it goes without saying that if his Sandusky experience could be repeated in like manner elsewhere (or, rather, everywhere), there would be no further need for keeping the matter of combined gas and electric supply in the category of moot points. The same assertion will apply to Mr. Christian's paper on the "Relative Cost of Coal and Water Gas." In fact the latter gentleman's experience is directly in conflict with that reported from the majority of localities. The papers presented are valuable and important, which goes to prove that the youngest of the Associations is plentifully supplied with those who have the courage of their convictions, and the bravery to express them.

Of course, President McMillin made an able presiding officer, and the business of the sessions was despatched with vigor and promptitude, while characterized by thorough attention to detail. Only one cause exists for regret over the Dayton meeting, which is that the President's offer of prizes for competitive papers, on the subject of high heats *versus* naphthaline crystals, failed to be taken advantage of—the requisite number of papers stipulated not having been presented.

In the matter of the banquet everything was as it should be, and reflected credit on those who arranged for it. By-the-way, it may be mentioned that the proprietor of the Beckel House (Mr. Horace Fox), taking advantage of the most approved methods for lighting his hotel, has adopted the Lungren burner. Six 16-foot Lungrens illuminated the dining-room, and Mr. Fox asserted that these had replaced 6 ordinary chandeliers, each formerly fitted with six 5-foot burners. The illumination of the place was little short of superb. The visit to the Dayton gas works, on the afternoon of the second day, ended the third annual session, and the members may well feel proud of its record.

ANNUAL MEETING OF THE GUILD OF GAS MANAGERS.

The Sixth Annual Meeting of the Guild was held in the Society's rooms, in the Mason Building, Kilby street, Boston, Mass., on Saturday, March 12th. The attendance of members was very complete; and among those present as guests, by special invitation of the Society, were the Hon. A. M. Norton, Nashua, N. H.; Messrs. Wm. H. Down, New York city; Fred. Davis, Waltham, Mass.; and Jno. Cunningham and C. H. Sprague, Boston, Mass. The annual reports of the retiring officers disclosed the fact that satisfactory progress had been made by the Society during the year. The election for officers to serve during 1887-8 resulted in the following choices:

President—Robert B. Taber, New Bedford, Mass.
Vice-President—C. F. Prichard, Lynn, Mass.
Treasurer—Jno. Andrew, Chelsea, Mass.
Secretary—E. G. Pratt, North Attleboro, Mass.

When routine business had been finished the gentlemen undertook to discuss one of "John Andrew's spreads," and were eminently successful in the attempt. The after-dinner speeches were apt and happy, and all present contributed something toward the fund of wit and reason. The Society starts upon its new year with every prospect of continued vigor and success.

MR. STRECKER SURPRISED.

It has been somewhat of an open secret of late that Mr. Alexander Strecker, who has been connected with what is now the Metropolitan branch of the Consolidated Gas Company for over 15 years—Mr. Strecker succeeded the late Mr. Ignatz Herzog, in the position of Engineer to the Metropolitan Company, on July first, 1883—had resigned to take charge of the Citizens Gas Light Company, of Newark, N. J. The date of his departure having been fixed for first instant, the officers and employees of the Metropolitan branch determined to "surprise" him, and this is how they did it. On the afternoon of March 29th the retiring Superintendent was invited to visit the purifying room, where, rather to his astonishment, he observed that Mr. Oscar Zollikoffer, and the latter's son, Mr. Oscar F. Zollikoffer, together with the under-officers and workmen of the Metropolitan station, were waiting to receive him. Ere he had recovered from his surprise Mr. Zollikoffer, Sr., mounted one of the boxes, and, preluding the action with a few well chosen words, presented Mr. Strecker with a handsome chronometer, chain and charm, which were elegant specimens of Tiffany's best art. The watch bore the inscription, "Presented by officers and employees of the Consolidated Gas Company, of New York (Metropolitan branch), to Alexander Strecker, as a parting token of appreciation and esteem. March 31, 1887." The recipient was completely taken aback, but what his reply lacked in words was fully made up by the emotion displayed. As evidence of the esteem in which he was held, we extract the following from Mr. Zollikoffer's presentation words: "You, as well as myself, are sorry to lose him, for he knew how to be just and fair to everyone—to his employers and to his employees; and understood the means with which to win the good-will of all around him!"

[Official Report.]

Third Annual Meeting of the Ohio Gas Light Association.

Held at the Beckel House, Dayton, Ohio, March 16 and 17, 1887.

First Day—Morning Session.—Wednesday, March 16.

President McMillin called the members to order, Secretary Butterworth occupying the recorder's desk.

Roll Call.

The following members responded to their names:

Active Members.

Allison, M. C., Xenia.
Bate, Joseph, Muncie, Ind.
Bates, T. A., Circleville.
Bushnell, A. S., Springfield.
Butterworth, Irvin, Columbus.
Canby, R. H., Bellefontaine.
Converse, C. M., Delaware.
Coverdale, R. T., Cincinnati.
Cressler, A. D., Ft. Wayne, Ind.
Dell, J., St. Louis, Mo,
Dickey, R. R., Dayton.
Dittmar, R. A., Troy.
Fabing, F., Fremont.
Gemuender, M. A., Columbus.
Gibson, W. H., Lima.
Graeff, G. W., Jr., Phila., Pa.
Gwynne, J., Fostoria.
Hamlin, E. W., Wilmington.
Harris, J. A., Phila., Pa.
Huntington, P. W., Columbus.
Kinsman, N., Springfield.
Light, J., Dayton.
McCann, J., Portsmouth.
McDonald, W., Albany, N. Y.
McMillin, E., Columbus.
Padan, H., Portsmouth.
Perry, A. T., Cleveland.
Phillips, J. H., Cincinnati.
Prichard, W. W., Ironton.
Printz, E., Zanesville.
Ranshaw, H., Cincinnati.
Raynolds, J. A., Canton.
Roots, D. T., Connersville, Ind.
Ross, W. A., Kenton.
Salter, J., Covington, Ky.
Salter, R., Covington, Ky.
Sisson, F. N., Albany, N. Y.
Smallwood, J. B., Baltimore, Md.
Spinning, D. C., Dayton.
Stacey, W., Cincinnati.
Tayler, G. H., Warren
Thompson, H. C., Cincinnati.
Walker, J. H., Jr., St. Louis, Mo.
Welch, C. H., Athens.
Wilkiemeyer, H., Lancaster.
Wood, P. J., Wilmington.
Wood, T., Sandusky.

Report of Executive Committee.

The Executive Committee's report was received and read. It stated that an application had been made by Mr. G. W. Graeff, Jr., of Phila., Pa., for permission to report the proceedings. The committee recommended that the application be referred to a special committee with instructions to report upon the matter at the next annual meeting. The Executive Committee recommended that Messrs. Eugene Vanderpool, of Newark, N. J., W. A. Stedman, of Newport, R. I., Jno. P. Harbison, of Hartford, Conn., and Geo. G. Ramsdell, of Vincennes, Ind., be elected Honorary Members of the Association. Also, that the applications for release of membership from Messrs. Geo. Turner, Phila., Pa., and Wm. Enfield, Dallas, Texas, be granted.

The President explained that the Association, at its first annual meeting, had made the American Gas Light Journal its official organ, and that such action would have to be rescinded before a different course could prevail. Mr. Gemuender asked if a contract had been made with the Journal, and the President replied, "That is what it really amounts to." Mr. Gemuender moved that the report of the Executive Committee, in regard to the application, be adopted. Agreed to. The President appointed Messrs. Eugene Printz (chairman), Jos. Bate and C. H. Welch as the special committee.

Election of Honorary Members.

The President asked the pleasure of the members in regard to the committee's recommendations to Honorary Membership. On motion of Mr. Dickey, the Secretary was instructed to cast the affirmative ballot of the Association for the gentlemen above named. Secretary Butterworth subsequently reported that he had carried out the instructions, and the President thereupon declared that the nominees had been unanimously elected to Honorary Membership.

The Secretary's telegrams of notification to the gentlemen thus elected were duly responded to by them.

Released from Membership.

The President, alluding to final recommendation of Executive Committee, explained that Messrs. Turner and Enfield were *ipso jure* released from membership.

Committee on Applications for Membership.

The President appointed Messrs. R. A. Dittmar, Fred. Fabing and Jos. Gwynne a committee on applications for membership.

Election of New Members.

The committee subsequently reported in favor of the election of the following applicants:

Alexander, J. W., Painesville.
Barkdull, L. C., Sidney.
Cradit, S. B., Ripley.
Carroll, A. J., Steubenville.
Devor, J., Greenville.
Evers, M. B., Jr., Van Wert.
Jones, T. C., Delaware.
Light, G., Dayton.
Murphy, J. M., Chicago, Ills.
Rempel, F. F., Logan.
Witham, S., Gallipolis.
Bierce, F., Memphis, Tenn.
Clark, D. M., Elyria.
Christian, G. H., Jr., Norwalk.
Critchlow, J. M., Pittsburgh, Pa.
Denniston, W. H., Pittsburgh, Pa.
Hurlburt, H. L., Oberlin.
Lindsley, E., Cleveland.
McCook, G. W., Steubenville.
McCall, H., Tiffin.
Smart, G. M., Dayton.

The applicants were thereupon elected to active membership.

Reports of Secretary and Treasurer.

The annual reports of Secretary Butterworth and Treasurer Raynolds were read and received. The Secretary reported that the roll included the names of 2 honorary and 79 active members. Two had withdrawn during the year; and the mortuary record revealed the deaths of four members since the date of organization.

Treasurer Raynold's report showed that the Association had a balance to credit of $406.24. Both reports were dated March 15, 1887; and the financial document was attested and vouched for by Mr. Wood, of the Finance Committee.

PRESIDENT'S ADDRESS.

President McMillin now read his inaugural message. It is as follows—

To the Members of the Ohio Gas Light Association:—After a year of increased prosperity we are again assembled to hear and discuss questions of economic interest pertaining to our business. That all have been profited by the discussions and consultations had at our two previous annual meetings there can be no reasonable doubt. If this meeting shall be equally productive of good the fact will be gratifying to us all.

The great improvement in the general trade of the manufacturing and commercial interests of the country has brought additional business to most of the companies represented in this Association. This increase of business brought with it a demand on the part of the consumers, generally, for a reduction in price. Twenty years ago, when gas was $4 per thousand, the consumer thought he would be happy if he could only get his gas for $3.50, and he had but little thought of ever seeing gas below the latter figure.

Notwithstanding the fact that gas companies are considered illiberal and arbitrary, they are still able to show a greater and more rapid reduction in the price of their product than that of any other branch of manufacturing of which I have any knowledge.

Probably, at the present time in this State, the percentage of companies selling gas at a price above $2 does not exceed that of those selling at above $4 twenty years ago. Probably twenty times as much gas is now sold below $2 as is sold at and above that figure. In fact I believe I would be safe in saying that three-fourths of the total product of the works of the State is now sold below $1.50—more than half of it at and below the low price of $1.25 per thousand.

Still the demand for further reduction is heard in the cities where it is sold the cheapest; and, strange to say, the companies, or many of them, are almost persuaded to make further concessions.

Gas works are owned in this country almost exclusively by individuals or private corporations organized for profit. Water works are generally owned by the municipal authorities. Have these *public* institutions dealt as liberally with their patrons as have the gas companies?

While gas companies go on reducing the price from year to year, improving the illuminating power, increasing the purity of the gas, and furnishing the consumer with better appliances for its consumption, water works owned by the public have practically been at a standstill. Let us continue to reduce our prices and continue to improve the quality of our gas, so long as, while so doing, we can reap a fair return upon our investment.

I am inclined to think that increase of quality and reduction in price may travel further hand in hand, with a continued fair profit, than most gas men suspect; but, on the other hand, if anyone supposes that he can reduce the number of complaints, the fault findings, and the false accusations, by either reducing the price or improving the quality of his gas, he will have his mind disabused of that erroneous idea after he has made the experiment.

Let us all endeavor to do our duty, both to the public and the stockholders that we represent, regardless of what shall follow.

During the past year wonderfully rapid strides have been made by our competitor—the electric light. To this fact we should not shut our eyes. Millions of dollars are being invested in plants for manufacturing apparatus, and millions more in plants for generating lighting currents. That much of this will be a "permanent investment" there can be but little doubt. We see a few instances of it in our own State. The incandescent light does not appear to be able to compete with either the arc, gas, or coal oil lighting, at prices that can maintain the value of the capital invested. But even in this

direction much improvement is reported to have been made. There is a firm now organized and doing business in Pittsburgh, Pa., with a capital of $5,000,000, who believe they have solved the problem of cheap incandescent lighting. With their appliances they undertake to say that, under certain conditions, where other systems would have to expend $1,000,000 in plant to do certain work, they would do the same work more satisfactorily with an expenditure for plant not to exceed $100,000. If it be a fact that the heretofore necessary outlay for a large plant may be divided by ten, then they are indeed getting down to a coal gas basis. This mammoth company, however, do not propose to fight gas companies, but to satisfy them of the truthfulness of their claim, and of the further fact that the same company can convert the illuminating gas plants into fuel gas plants, with profit to gas companies. To most of you these claims may sound like much of the twaddle that you have been hearing for some years, and you may be right; but bear in mind that to go down from $1.25 to 50 cents per thousand cubic feet would be a much less improvement, with our present knowledge of the business, than it was to go from $4 down to $1.25 per thousand. Reject no proposed improvement without careful investigation. Even a quack may succeed, by accident, in combining some stolen ideas and bring forth an invention of utility and merit.

The mammoth falsehoods that have been sown broadcast during the last few years respecting the merits of water gas have so prejudiced the most of us that we find it difficult to do justice to almost any system that is at all tainted with that production. This ought not to be; the water gas systems have their merits, and in many localities can doubtless be combined with coal gas to the advantage and profit of the gas company. The "raiders" seem to be chiefly in the water gas gang; but *all* raiders are not there—neither are all water gas men raiders—and I sincerely trust that the members of the Ohio Association, in discussing these questions, will not so far forget themselves as to abuse gentlemen—not for their personal shortcomings, but because they may belong to a class of engineers for whom we may not have the most profound respect. All the Gas Associations of this country accept water gas men into fellowship, and our own Association is no exception. As individual members they are entitled to all the courtesies, and are eligible to all the honors to which a coal gas man may aspire.

The union of the electric and gas lighting interests is a question that is exciting much interest at the present time; but as we are to have papers on this subject I will not discuss the question in this connection further than to say that I do not oppose the bans.

In the able address* of our honored ex-President, General Hickenlooper, a plan was outlined for a proposed State Gas Commission. The plan was heartily indorsed by the members in attendance, and a committee was appointed to submit the question of the feasibility and desirability of working for the creation of such a commission. Pamphlets were issued, giving the address of the President in full, and two copies of this pamphlet, together with a circular in which a number of questions were asked, and with blank space for answers, were forwarded to every company in the State, with a request to respond, as soon as convenient, to our Secretary. A second appeal had to be made before many would respond. In some instances, third and fourth appeals were made without bringing forth a reply.

Of all the replies received, 72 per cent. unconditionally favored the plan; 20 per cent. favored the plan, with conditions; one per cent. favored another plan for a like purpose; and 7 per cent. opposed commissions in any form. Now, that would appear to be a pretty hearty indorsement of State Commissions; but you have not heard it all. Only 42 companies out of nearly 100 cared even enough about the subject to respond to our inquiries. Think of it! Less than one-half!!

If it would not be considered an impropriety, I would venture a guess that the companies failing to respond are in greater need of some such regulation than those who favored it; and further, that they are more given to growling about the condition of the present statutes governing gas companies than are other members of the gas fraternity. I doubt if there is a guilty man within the sound of my voice. Men who will not say "yes" or "no" to the questions that were asked in our circular are not much given to attending conventions; but if such an one be here, his presence indicates an honest effort on his part to reform.

Of course, with the partial response received, no effort was made to have a commission established. That a gas commission would bring about a more satisfactory condition of affairs I verily believe.

I have read the annual report of the Massachusetts Gas Commission, for 1886, with interest and profit; and while I agree with my worthy predecessor that in return for a submission of our business to agents of the public the gas companies ought to have direct and positive protection against raiders and blackmailers, yet I do further believe that a State Commission, such as Massachusetts now has, does, in a measure, protect companies against this class of despoilers.

When such a commission shows to the public that a gas company is managing its business honestly, that its meters do register gas correctly, and that the company does not make more than a fair profit on its investment, then the public will be slow to invite another company to tear up its streets, and divide the business, thereby increasing the cost of manufacture, and at least deferring the time when a permanent reduction can be made in the price of gas. That such is the result of competing companies the Massachusetts Commission plainly tells the public. I repeat: *Knowledge from such a source* affords partial protection, at least.

No startling improvements in the modes of manufacture have been made during the past year, but rather a general and gradual advance has occurred all along the line, and especially in the adoption of regenerator furnaces. They are rapidly becoming the rule, instead of the exception. Builders who now construct the ordinary shallow, direct firing, retort furnace will hardly be regarded as keeping pace with improved modes.

As a result of better furnaces the yield of gas per unit of coal is being increased. There are probably as many gas works in the country to-day that reach a maximum of 5.25 feet per pound of coal as there were that reached 4.75 feet ten years ago. There is still vast room for improvement. When we treat our coal properly we will, I believe, receive 6 feet per pound, and possibly much more.

Coal with the largest per cent. of hydrogen makes the largest yield of gas. The coking coals in general use in this country contain hydrogen enough to carry nearly double the quantity of carbon that we now volatilize, and, could we make it do so, we would largely increase the quantity of light per unit of coal.

The high heats now in general use in retort houses are obtained with the expenditure of a much smaller per cent. of the coke made than were the former low heats secured; but the high heats have some disadvantages—such as choked stand-pipes, pitched mains, and naphthaline crystals about the works. The latter probably gives the most trouble.

It is to be hoped that someone may throw some light upon the subject of the prevention of this annoyance at this meeting. I shall be disappointed if the question is not thoroughly ventilated.

In purification but little, if any, advance has been made—especially in this country; but since oxide of iron has come into general use the cost of purification per 1,000 cubic feet has really become so insignificant that the subject does not now receive the attention given it a few years ago. In England what is known as the Claus' process of purification in closed vessels has made some progress. A careful study of this system will be found both interesting and instructive. Before leaving this subject I will sum it up by quoting one sentence from the able address* of President Eugene Vanderpool, at the Cincinnati meeting of the American Gas Light Association. He says: "As compared with a few years ago, we show a gain of from two to three times the yield per retort; from two to three times the product per man; an economy of one-half to two-thirds in fuel for the carbonization of coal; an increased yield from the coal carbonized of ten to twenty per cent.; a decreased wear and tear account, and an improved candle power. We use new and very efficient apparatus for removing tar; ingeniously designed scrubbers for extracting the ammonia; improved methods of mixing and using lime; and efficient and more economical ways of purification by oxide of iron." Every assertion of which is, to those who have properly kept pace with the times, a well-known fact.

Natural gas continues to grow in interest, and especially so in our own State. Just where it may or may not be found no man knows. That secret is given up only as the drill pierces the deeply hidden recesses of the earth. But gas companies have no cause for alarm. The business of gas companies in and about Pittsburgh has grown rapidly since the introduction of natural gas in quantities so great that the ordinary mind fails to grasp their immensity. Natural gas makes business flourish in towns and cities favored with it, and general prosperity helps the gas companies. I would welcome natural gas to any city in which I have gas interests.

"How shall we economize?" is now the vital question of the day. Well, there are many little ways, perhaps, still left open by which we can reduce gas a fraction of a cent per 1,000 feet; but of the ways now open to us one transcends all others in its magnitude. *Increase your consumption*, especially your *day* consumption.

Did you ever compare the cost of distribution, per thousand cubic feet, for the months of July and January? Well, if you have not, I will tell you that it costs about twice as much in the former as it does in the latter month. Now, it is easier to introduce stoves for summer cooking than it is to do the same thing for winter heating. Put down your prices and you will put up your output.

Probably there has been no greater advance made in any branch connected with our business than in that of high power burners. The Lungren and the Wenham are most excellent lamps. They are economical, and, so far as I have observed, give satisfaction to the consumer.

Now a word to the superintendents and engineers, especially. Have we

* See JOURNAL, April 2, '86, p. 192.

* See JOURNAL, Nov. 2, 1835, p. 227.

made progress in acquiring knowledge during the past 12 months? I trust we all have. I have no knowledge of any business where the opportunities are so great for self-improvement.

Gas engineering embraces in its scope almost every branch of science. The day has passed when the young man can reasonably hope to rise in the profession without diligent study. A knowledge of physics and chemistry is almost, if not quite, an essential. The rule of thumb will no longer answer. Right here I would add a word to proprietors of gas works. You, gentlemen, can make no better investment than in that of purchasing a small library for the use of your managers. A $500 library would meet almost every requirement. A $50 library will possibly double the value of the services, to you, of your superintendent. Supply them with all the gas journals—orthodox and heterodox—and, above all, see that they attend the meetings of their gas associations.

In one respect our Society has been blessed beyond its merits. Considering the number of our membership, and that many are past middle life, our death roll is short. We chronicle during the year the death of only one member, that of Mr. John Anderson, gas engineer and retort manufacturer, of Ironton, Ohio. A committee will be appointed to suggest appropriate action.

Now, gentlemen, you are favored with a fine list of papers, all upon live subjects; and if we do not have an interesting and profitable meeting we will doubtless have only ourselves to blame.

Remember that you have not now that chief of all presiding officers in the chair; and, remembering this, try, in a measure at least, to compensate for it by assisting the presiding officer in the despatch of business. Speak rapidly and to the point, and speak distinctly, so that what you say may not escape the ear of the stenographer. Do not go too much into detail in your discussions; time is too precious for that. Above all do not move about or converse while another is reading or speaking. It is disrespectful to the speaker, and annoying to others who desire to hear all that is being said.

You will observe, from the printed programme, that we have quite a task before us, and that every moment of time must be improved, therefore I now especially enjoin upon you to be prompt to assemble at the hour named. It is not fair to ask a gentleman to read a paper—which occupied him perhaps days or even weeks in preparing—to empty or half-filled seats, hence it will be necessary for us to get to work at the hours named in the programme.

Thanking you, gentlemen, for the distinguished honor of presiding over your deliberations, and begging your indulgence for my shortcomings, we are now ready to proceed with the regular order of business.

On motion of Mr. Bushnell (the President insisted that the address be not referred to a committee) a vote of thanks was tendered the President for his address.

On motion, the President appointed the following

SPECIAL COMMITTEES.

Nominating Committee.—Messrs. A. S. Bushnell, P. W. Huntington, and R. R. Dickey.

Place of Meeting.—Messrs. T. Wood, W. A. Ross, and H. Padan.

Memorial Committee.—Messrs. R. H. Canby, A. D. Cressler, and C. Taylor.

RESPONSES FROM LETTERS OF INVITATION.

The Secretary read letters and telegrams, received in response to invitations to attend the meeting, regretting the inability of the recipients to be present at the meeting, from Messrs. E. Vanderpool, Newark, N. J.; C. W. Blodgett, Williamsburgh, N. Y.; C. H. Nettleton, Birmingham, Conn.; F. Egner, St. Louis, Mo.; A. W. Littleton, Quincy, Ill.; J. Somerville, Indianapolis, Ind.; T. E. Connelly, Pittsburgh, Pa.; I. Battin, Albany, N. Y.; C. F. Prichard, Lynn, Mass.; C. J. R. Humphreys, Lawrence, Mass.; A. C. Wood, Syracuse, N. Y.; and J. P. Harbison, Hartford, Conn.

The President—I notice that one of the newly-elected honorary members, Mr. G. G. Ramsdell, of Vincennes, Ind., is now in the assembly room. I am pleased to introduce him, and to say that we are happy to welcome him to membership in our Association.

Mr. Ramsdell—I am very much obliged to the Association for the honor conferred upon me this morning in electing me an honorary member. I had the pleasure of attending the meeting of the Ohio Association, at Springfield, last year, and am very glad to find myself with you again. I anticipate a pleasant visit.

Routine business having been disposed of, Mr. M. A. Gemuender, of Columbus, Ohio, read the following paper, entitled—

GAS COMMISSIONS.

I suppose that there is not a single gas company represented in this assembly, or even any in the entire country, which, during the last 15 or 20 years, has not had its share of quarrels with legislative bodies, been recklessly assailed by an ever ready press, and fought desperately against an adverse public opinion. As a necessary consequence this feverish state of affairs has, in a measure, retarded the development of our industry and hurt both producer and consumer. How to reduce this condition to a normal state is a question which has been awaiting solution for some time. The latest remedy proposed is that of a State Gas Commission—not in the nature of a temporary relief, but as a final settlement of the gas question. Before considering the functions of a Commission I think it necessary to analyze briefly the cause of the distrust existing between us and our customers.

When gas companies first came into being their existence was shaky and their future doubtful. Coal gas as a means of illumination was an experiment, and had still to stand the test of time. The public were more interested in the success of the trial than in the amount of dividends obtained by those guiding it. This is somewhat corroborated by the fact that many companies were originally granted an exclusive privilege for a long period of years as an encouragement. It was only after gas, as an illuminant, had been demonstrated a complete success, and had become a staple commodity, that the community began to calculate the cost. An object once in sight, the next consideration with a careful man is to obtain it with as little expenditure of energy as possible.

In time gas companies became large and wealthy corporations, which fact drew upon them the jealous scrutiny of the public. Complaints became numerous; and, as was perfectly natural, the meter was one of the first causes of trouble. This resulted 20 years ago in the appointment of a State gas inspector; but of him more hereafter.

Under the liberal and exclusive contracts which were then granted as a stimulus gas companies made good dividends from year to year, which the public, as they had no means of knowing facts, magnified considerably. It seemed to them that no matter how hard times were, or how general the depression, the gas companies were as prosperous as ever. Judging from some of the discussions at the American Gas Light Association meetings, I am somewhat of the opinion that the privileges originally granted the companies, and under which they became so prosperous, had a tendency to spoil some of the managements; they began to consider, owing to long possession, as their undoubted right that which was only granted as a helping hand. Having struck a profitable field, they expect to be guaranteed an undisputed possession, and to make no concessions on their part.

It is an acknowledged principle in political economy that when a new industry arises which proves more remunerative than the average, capital will at once leave the less productive channels to engage in the new one. This added energy soon reduces these earnings to the average. Our industry is no exception to the rule, and I am confident that as long as our earnings are a noticeable degree above the average we will be harassed incessantly, not always by rogues and blackmailers, but by honest capital seeking investment.

I firmly believe that when the patents now protecting the electric light and telephone companies expire these companies will have the same fight on their hands which we are now trying to get rid of.

All arguments tending to prove that the best and cheapest light is only to be obtained through the agency of one company may, with equal reason, be applied to telephone service. Are we, then, to have a State telephone commission? Our patrons bearing up under real or fancied wrongs will naturally seek relief by the aid of an active competitor; and not only so, but the inventive mind will continually strive to perfect a mode to supersede the present system. If gas could have been sold at 25 cents per thousand cubic feet, I do not think that much time or brains would have been wasted in bringing forth the electric light.

Of course, in this paper I entirely ignore the oft-repeated charges of dishonesty on the part of directors and employees. During the 12 or 13 years I have been connected with our company I have never seen the slightest effort made to obtain a penny which was not honestly considered our own. In fact, it would be extremely foolish for a company to act otherwise.

In spite of the endeavors of many managers to please their customers, schemes seem to be always handy to stir up discord, and agitation continues. To effectually stop this a State Commission is proposed. This commission is to decide whether or not the local company is honestly fulfilling its obligations, and also to have power to accept or reject all applications to erect competing works, regardless of the wishes of the local parties. To pay a large sum of money yearly and endow a board with less power would be, to say the least, extravagant. Any commission which could be appointed would simply be an arbitration committee, and must be one of two kinds: (1st) one with power to enforce its decisions, as any ordinary court of justice; (2d) one the acceptance of whose decisions depends entirely on the good faith of the party soliciting them. The former is the one which I presume is selected by the gas companies in general.

If a commission is a necessity, then it may reasonably be assumed that neither the municipalities nor companies possess the requisite honesty or ability to make and carry out a just contract for the supply of gas; but where is the third party to come from that is to make good these defects? Surely government boards and officials as a class have never been especially celebrated for either wisdom or righteousness. All the papers favoring gas

commissions which I have yet been able to obtain simply give a list of benefits which may be derived by concentrating much power in the hands of the few individuals comprising a commission, but never a single well demonstrated principle from which can be deduced a reasonable assurance that this particular body will be any better than any other political machine.

"The thing to be discussed is not so much whether, by any amount of intelligence, it is *possible* for a commission to work out the various ends consigned to it, as whether its fulfillment of them is *probable*. It is less a question of *can* than of *will*." Much could be said in favor of a monarchy provided one were but sure of a good monarch.

I have often wondered whether the gentlemen favoring the curtailment of commercial freedom by means of State boards of control realize that they are asking something entirely at variance with our generally accepted political creed—viz., placing the responsibility along side of the power and benefits. It is not, as an Ironton (Ohio) editor puts it, merely a State regulating a corporation which is only one of its creatures, but a direct effort on the part of the State to take from the people the right of managing purely local affairs.

That cities and corporations, while in pursuit of their own welfare, occasionally make blunders and serious errors is not a sufficient reason for relieving them of the responsibilities connected with the making of contracts. Permanent advances in civilization were only brought about when the people were allowed to feel the bad as well as the good results of their actions, and thus learn from actual experience the proper line of conduct.

Chief Justice Taney remarked: "It can never be maintained in any tribunal in this country that the people of a State, in the exercise of the powers of sovereignty, can be restrained within narrower limits than those fixed by the Constitution of the United States, upon the ground that they make contracts ruinous or injurious to themselves. The principle that they are the best judges of what is for their own interest is the foundation of our political institutions." This opinion, although given in a case differing from the one under discussion, nevertheless enunciates a principle which is just as applicable to the affairs of citizens and of municipal corporations.

Before taking from the people and business organizations the right to exchange their earnings with whomsoever they may deem fit, it is absolutely necessary for the advocates of commissions to clearly prove that the third party to whom they are to surrender their freedom not *can* but *will* do more for them than they will do for themselves. A current "opinion" will not do. It must be more than one chance in two that a commission will be honest, as a perfect commission can at best procure but temporary good, while a bad one can cost a lasting evil.

Now as far as arbitration from a permanent, State-appointed body is concerned. It seems to me that no man is morally bound to accept the decisions of an arbitrator whose services he has not even had a chance of refusing, nor will he willingly leave any question for arbitration unless he is sure of one-half of the committee, and has reasonable prospects from the referee. As a private citizen would not trust his personal affairs to such an organization, I fail to see how it can give any better satisfaction in public affairs.

We have at present Railroad and Insurance Commissions, which have probably done some good, that is, when composed of good officials; but is anyone prepared to say what these benefits have cost the people? Even if railroad accidents are less in number than in past years, I think it would be very hard to prove that Railroad Commissions brought about the improvement. When people suspect insurance companies it is not because they have received valuable information from the State, but because experience has taught them to be watchful. Our present Insurance Commissioner, who has the reputation of being a careful and active official, has lately routed out some bogus concerns. In the long run, however, it is the hits that are scored and the misses never. Place opposite the amount saved by us by a timely exposure the sum paid all past officials in salaries, fees, clerk hire, office rent, etc., and which way will the balance go?

It must also be remembered that a commission once established is not so easily gotten rid of. History teaches that it will entail a heavy expense long after its services have ceased to be of value.

Mr. Greenough, in defending gas commissions, states that the Massachusetts Commission has absolutely *nothing* to do. This, in my opinion, rather weakens his cause. We all know that when a new political board comes into existence, as all eyes are turned toward it, the first appointments are generally good; but when a few years have passed and the duties have become routine, the appointments are of the ordinary political kind. Now let the office be a high-salaried sinecure, and it simply becomes a "snap" for political pets.

To illustrate my position I will give the history of the Ohio State Gas Inspectorship.

April 6th, 1866, the Legislature created the office of State Gas Inspector. The chief inspector was to be appointed by the Governor, and his term of office to be two years. He was to possess a "thorough knowledge of the chemical composition of illuminating gas, and the structure and practical operation of gas meters." His duty was, "to inspect, examine, prove and ascertain the accuracy of any and all gas meters to be used for measuring the quantity of illuminating gas to be furnished to or for the use of any person or persons, and, when found to be correct, to seal, stamp or mark all such meters, and each of them, with some suitable device and with his name, the date of his inspection, and the number of burners it is calculated to supply; such device shall be recorded in the office of the Secretary of the State. * * *

"He shall not in any manner, directly or indirectly, be interested pecuniarily in the manufacture or sale of illuminating gas, or any article or commodity used by gas light companies, for any purpose connected with the supply of gas. * * *

"At the request of the Mayor or Aldermen of any city, or trustees of any town, he shall report if the gas is of legal standard, and sufficiently purified from sulphuretted hydrogen, ammonia, and carbonic acid, and shall not contain more than a specified per cent. of sulphite of carbon."

His salary was afterwards made $3,000 per annum. He was empowered to appoint deputies in other cities who were paid in fees of 25 cents per meter tested, and upwards, according to size of meter. Gas companies were obliged to foot the bill.

Now, as is usually the case, the first appointment was a very good one. Prof. T. G. Wormley was the first inspector. He is a chemist of great reputation, a gentleman of excellent social standing, and fulfilled his duties perfectly through many successive administrations. At last, however, a change of party brought in a new expert, not of the same kind, but a politician from Wood county, who knew absolutely nothing of gas or meters; he placed in our city, as deputy, another expert who knew, in this respect, just twice as much as his chief. When this deputy began his tests he noticed that the indicator on the prover did not point to the same figure as the index on the meter dial. Now came the question. "Was it a plus or a minus test?" He and his assistant finally agreed to call it minus. When his test showed a meter more than three per cent. out of the way, he condemned it by chalking a cross on it, and placed it to one side. When our men noticed this they would slyly rub off the mark, place the meter in another lot, and the next time it was almost sure to pass "O. K." This man who was expected to tell whether or not gas contained an "excess of sulphite of carbon" never even realized the importance of even temperatures, but would walk into a room, knock the ice out of the prover, and proceed with his tests, which were, in fact, absolutely worthless.

When the political wheel again turned, and the inspector found himself about to be superseded, he declared the office of State Inspector a useless sinecure, and recommended its abolition, which the Legislature accordingly did, April 12th, 1876, just 10 years after its creation. This experiment cost the gas companies many thousands of dollars, and proved, as might have been foreseen, a decided failure. The Legislature now referred all disputes exactly where they belonged—that is, to the local company and council.

If after all it could be shown that this measure, which was gotten up with the best of intentions, had demonstrated to the public the accuracy of meter registration, the large sum of money expended might not now be considered a total loss; but I do not think that anyone will claim that this has been done, as nine out of ten consumers never knew that there was a State Inspector, or cared the least for his tests, if they did. As far as I know the abolition of the office was never regretted by anyone.

The reason given by some for taking from cities the right to manage their own affairs is that Legislatures possess a higher grade of intelligence than city councils. Now, this may be true when small towns and villages are under discussion, but I do not think it will hold good when our large cities are brought into comparison; and let me say right here that if a commission is needed it will be principally by the larger and not by the smaller towns. Who ever knew of a small town with opposition works? In fact I do not think that in our State we have a dozen cities whose companies are large enough to seriously fear a rival. In small towns where gas managers have the great advantage of personal acquaintance with every leading citizen, and nevertheless have an opposing works thrust upon them, I think it is no more than they deserve, as they are incapable of properly managing their affairs.

In our Council at Columbus, although we have our full share of ward politicians who will advocate any measure which secures them popularity, and amateur gas experts who are only expert in betraying their own ignorance, yet the majority of the members are known as successful business men who materially take part in the benefits and share the losses of our city. No council ever introduced or furthered more imfamous measures than those presented by Allen, O'Myers, Cable and others. The recent Payne scandal also does very little toward showing the superior honesty of the Legislature. The present Legislature is composed of about 147 members. Of these about 76 are country lawyers and farmers. In fact there are only about 30 of the entire 147 who live in towns of 10,000 inhabitants or over. Now, is it probable that such a body can be safely trusted to regulate city affairs? Is

their experience in municipal questions sufficient to warrant our abdication in their favor?

In speaking of the success of the Massachusetts Gas Commission, which is, after all, at present but an unfinished experiment, Mr. Ramsdell says: "This fact conclusively shows that, under like circumstances, commissions may be formed and set in operation in other States; in fact, the combined influence in almost any State of those interested in gas stocks, if properly concentrated, can so affect legislation as to secure practically the measure desired—if that measure is equitable and just." Further on he says: "Indeed, it seems to me that one of the strongest arguments in favor of a commission is to call attention to the fact that there is so much legislative activity in many of our States. * * * * Experience is teaching us that gradually we are approaching legislative control; that each year provides its quota of enactments bearing upon gas matters; that very few of these are of benefit to consumer or producer; that, when the effort of honest men, they are almost always born of a suspicion caused by an absolute ignorance of our business; that these laws, whether advanced by worthy or unworthy motives, are almost invariably annoying, pernicious, and costly to gas companies, and in many cases very closely resembling blackmail."

From the above I deduce that Mr. R. decries legislative interference when done by others, and proposes to stop it by doing a little of it himself; that is, to get in his blow first. It will not do to say that his action is purely negative, else in entirely stopping legislative activity he would do wrong, as he cuts off the possibility of good as well as of bad laws. I doubt if the public would enjoy his interference a bit better than he enjoys theirs.

On this very point Prof. Sumner expresses himself as follows: "The fashion of the time is to run to government boards, commissions, and inspectors, to set right everything that is wrong. No experience seems to damp the faith of our public in these instrumentalities. The English liberals in the middle of this century seemed to have full grasp of the principle of liberty, and to be fixed and established in favor of non-interference. Since they have come into power, however, they have adopted the old instrumentalities, and have greatly multiplied them since they have had a great number of reforms to carry out. In this country the party which is 'in' always interferes, and the party which is 'out' favors non-interference. The system of interference is a complete failure of the ends it aims at, and sooner or later it will fall of its own expense and be swept away. The two notions—one to regulate things by a committee of control, and the other to let things regulate themselves by the conflict of interests between free men—are diametrically opposed; and the former is corrupting to free institutions, because men who are taught to expect government inspectors to come and take care of them lose all true education in liberty." I for my part believe the less we have to do with politicians and the more we mind our own business the better for us. The history of the past is full of laws which seek to obtain something for nothing. If the principles which are the foundation of our government are correct, then all such things as gas commissions, Pugsley election, and Bohemian oats laws are fundamentally wrong. They simply seek to obtain a benefit for one while shifting the responsibility connected therewith to another. Instead of carrying out the spirit of pure democracy they are, in fact, socialistic in their nature.

I also believe that gas companies have a right to earn and declare 100 per cent. dividends, provided they stand only on their own feet and ask favors of no one; but in so doing the struggle for existence will be bitter and unceasing. The moment, however, we stoop to ask or accept a favor, that moment we place on our shoulders a new obligation and cease to be independent workers. I know that the proposed measure is not asked as a favor, but as a mutual benefit; nevertheless, when we ask a protection not accorded other lines of production we are seeking a special privilege, and I cannot see how this can be otherwise regarded. Whoever heard of drygoods merchants asking for a commission? Is there any reason why the sale of clothing should be any easier than that of gas? A successful merchant not only sells his goods at a reasonable figure, but is compelled to directly inform the public that he does so by means of skilled agents. What constitutes the gas business an exception to this general rule?

We claim for ourselves the same privacy of accounts accorded other houses. How, then, are our customers to know whether or not our prices are reasonable? How many companies, except during the excitement of a gas war, ever volunteered any statements regarding their profits?

We have in our city an organization known as the Board of Trade. This is an assemblage of a large majority of our best business men—those who pay the taxes, and who would be the main sufferers from bad legislation. Should the occasion ever arise, we could appear before them and be sure of a fair and careful hearing; and as our story is perfectly straight, and they have the welfare of the city at heart, we would be sure of their hearty and valuable support.

The policy of our company, during the last few years, has materially changed. We have lost much of our reserve. We occasionally answer newspaper criticisms, and take part in friendly discussions. Our management has even delivered addresses and volunteered information to our customers, and I think it has made us many friends. This line of conduct is worth more to us than a dozen political commissions.

I think the time is not for distant when most cities will follow the example of London, and enter upon an exclusive contract with one company on the condition that its dividends will not exceed a given figure, and that its accounts will be regularly inspected by municipal authority.

As an incentive to improvement, the London Company is allowed to declare one-fourth per cent. more dividend for every reduction of one penny per thousand in price. This, is, however, open to one objection. The rate of dividend is calculated on the present system of gas making, and all future improvements, after allowing for the cost of advancement, instead of accruing to the consumer, as is the case in all other lines of production, is shared by the company. Now, there must come a time when the cost of gas making will reach the minimum, and then the consumer will have to pay that cost plus the cost of one-half the entire previous advances, which have already been paid for. I think it would be better to contract with the company at a definite rate for a definite time, and if any improvements are made allow the company the entire benefit thereof. When the agreement expires enter upon a new contract, with the improved system as a basis for figuring. This would operate after the manner of United States patent grants.

I have endeavored to show as well as a limited paper will allow that our present trouble is but the same as has been undergone by every other industry, and that these have only been allayed by allowing business interests free play to regulate themselves. If, however, gas companies in a disputed question desire arbitration, why go out of their own cities to appeal to some politician? Have they not men in their midst of such standing as to command the respect of everyone? Or can the people of Dayton, Ohio, only find such by sending to Massillon, or Covington, Ohio? A spontaneous and resident committee will always have a decided advantage over a permanent State-appointed board—

First—Because, being selected when everyone is interested and anxiously awaiting a settlement, they are selected with great care.

Second—There will be little time for bribery.

Third—The expense will be small, and ceases entirely when the matter in dispute is settled.

Fourth—Being members of the community, they will not only share the benefits of an honest and carefully administered trust, but also help *pay* the *penalty* of a mistake.

The last reason, which I consider the most important, is the very one a State Board would fail to come under. With the latter it is simply a question of dollars and cents. A good-sized bribe would be likely to find a taker, especially if the term of office is about to expire, and the salary to end.

Now, as we already have active competitors in the shape of electric lights, and oil, the public do not feel so entirely at our mercy as formerly. Under these circumstances I should not deem it wise to handicap our industry by trying costly experiments.

Discussion.

The President—You have heard a very able paper—one that evidently has had much thought given to its preparation, and it is valuable to us because it takes the other side of the question. We have heard only one side of the question in our Associations for the last two or three years. Probably no other man in the room is so well informed on the topic as our honorary member, Mr. Ramsdell, of Vincennes. We shall be glad to have him open the discussion.

Mr. Ramsdell—I was much pleased with the paper, and the arguments offered by the writer are certainly very weighty. The same arguments occurred to me when engaged in preparing the report* of the committee appointed by the Western Gas Association, which report was prepared after a careful study of the entire subject of gas commissions. I see we both agree on the fact that the English system is what we are after. One important feature noted by Mr. Gemuender is the difference which exists (because of the competition of electric lighting) between the present conditions and those that ruled at the time when the report was presented. In my own experience at home we have competing electric lighting companies that bothered our stockholders very much, but still they have tended to relieve us from many of the very difficulties referred to in the report. We have had less complaint and trouble last winter than we ever had before. Consequently I agree that the lapse of time has changed some of the conditions. I do not want to be understood now as saying that I do not favor gas commissions. My belief is as strong now as it ever was in that regard. The committee report said that in their opinion gas commissions could be made successful in some States, while in other States the reverse would rule. Mr. Gemuender very properly refers to Ohio. It has been and is my opinion that Ohio Indiana, and most of the other Western States, are not yet ready for gas commissions. As was stated by the President of the Massachusetts Commission

* See JOURNAL, July 2, 1866, p. 5.

according to my understanding of a reported remark made by Mr. Greenough, the reason why the commissioners did not have much to do in Massachusetts was because the gas companies and the local communities were striving to meet the requirements of the law, and that the whole machinery was now moving in a satisfactory manner.

The President—We have with us Mr. Monks, of Boston, Mass., who is quite familiar with the working of the Massachusetts Commission. The Association would be glad to hear from him.

Mr. Monks—I am glad to be with you to-day, and have been accompanied by a gentleman, Mr. W. Eliot Fette, who is largely interested in gas investments in the East. I was a pleased listener to Mr. Gemuender's paper, for it treats of a subject about which we have much to learn. The English policy of regulating the gas business seems to have been a success, and I will say that we apparently have a state of affairs in Massachusetts differing from that existing in Ohio. We, in our section, feared the local rulers most—that is, those who govern the larger cities and towns. It is a settled fact that large amounts of idle capital seem to be controlled by those who seek to help you in those duties which you believe you can do better yourselves unassisted. I personally have sometimes been called in question in this matter, and I wish to say here I endorse heartily everything said by the President of this Association about single companies as opposed to competition. I am in accord in this matter with the gentlemen representing the Boston companies. For the 25 years of my official connection with the South Boston Company I have held to that principle. It is only fair to say that Boston had one element of weakness that could have been eradicated. Our city has prospered and spread until its extension rendered necessary the absorption of towns which at one time were widely separated from it. The result is that the plan of annexation gave to Boston no less than eight distinct gas companies. In my judgment these should have been amalgamated in one, or at most, two companies. I was interested in the matter, and my business interests being largely connected with gas manufacture, I proposed to step down and out, if by so doing we could accomplish unification. The excessive number of suburban companies, however, does not excuse the grant of two gas charters for the city of Boston proper. If the Massachusetts Gas Commission had been established, say, two years earlier than was actually the case I think the Boston situation would have been altered. However, I now believe that Massachusetts gas men need not have fear for the future. The sanction of the local authorities to allow the building of competitive gas works must also receive the assent of three men who are State officials. On questions of this nature the sentiment of those who rule the largely populated districts are opposed to us; but our State legislators are taken, as a rule, from the ranks of those who think studiously and act honestly. They are men upon whom we can depend. I can take but one exception to the present Massachusetts Commission, and it applies neither to the character of nor the disposition of its members to do right, which is this. I believe some one man of that commission should understand practically the science of gas making. I make this honest criticism of our commission because the matter is in the experimental stage in our State. I believe it is going to prove a great and abundant success. I think protection from raiders is a matter of great importance to you all.

Having alluded to something that happened at one of the hearings before the Massachusetts Commission in the case (now on) of the Worcester Gas Light Company, Mr. Monks said: Now, I say that if gas commissions are to be appointed in other States the pertinent question for you to consider is the character of your State Legislature. Are you better off in the hands of your local authorities; or are you better off in the hands of your State Legislature? In Massachusetts we are convinced and satisfied that men appointed by one worthy to stand as Governor of the State of Massachusetts will be those who cannot be bribed; but at least one commissioner ought to have a thorough knowledge of the subject of gas making.

The President—Will Mr. Fette, who, besides being familiar with the Massachusetts Commission plan is also conversant with the English laws, take part in the discussion?

Mr. Fette—I ought, in the first place, to disclaim any right to be called a gas engineer. I have had charge, in a general way, of several companies which I have been interested in, and if they have been successful I think I owe it entirely to the faithful services of my superintendent, who has always been ready to accept my suggestions when they recommended themselves to his good judgment. Therefore I do not feel qualified to appear before such a body as this and express an opinion. I can fully endorse what Mr. Monks has said with regard to the State Commission—so far as I know of its workings. I have had since its appointment a feeling of security against raids on the companies in which I have been interested, which I did not have before, because of the character of our city governments. I think the appointments made by Governor Robinson were excellent; and the chance now is that before we can be raided upon by outsiders, who want to share in the little prosperity that we have earned, we shall have a chance to be heard, not only by the local authorities, but also by the Commissioners—men who are entirely disinterested either in the price of gas or in any other way, and who are therefore willing to listen to us impartially. If they will adopt the suggestions which have been made (as I think they will), and pursue a little different course in future from what they did in Worcester—that is to say, have their hearings open to suggestions to be offered by the companies, in order that they may learn what is really best for the public—I see no reason why they may not become a great success.

The President—We have heard from no Ohio man yet, excepting the author of the paper. I know they are exceedingly modest! Perhaps Mr. Denniston, of Pennsylvania, will tell us what he thinks of gas commissions.

Mr. Denniston—I can tell you very little, for we have had no gas commission in our State. I have been interested in the discussions had at the various meetings on the subject, in order that I might know how to look upon the matter if it were ever brought up in Pennsylvania. So far we have had no occasion for a commission. We put up the best way we can with the raiders. I am in sympathy with the methods proposed by Mr. Gemuender. If there are to be commissions at all, or if any outside control of our invested capital is to be made, I think it should be exercised by the municipal authorities. I think I would risk it with them rather than with the Legislature. I have had some experience with members of the City Council of Pittsburgh, and I claim them to be neither better nor worse than the common run of councilmen; but I do know that, as a class, they are unfriendly to capitalists and corporations. Upon the whole (I can only speak of what I have learned from reading), if there are to be commissions I prefer that they should be local rather than general.

On motion of Mr. Hamlin, a vote of thanks was tendered to Mr. Gemuender. [The motion was carried. At this point the Secretary said he wished to add his personal thanks to those members who kindly agreed to his request to furnish papers. In reply Mr. Gemuender said, speaking for himself, he came there to listen to the other papers. He had but contributed his share to keep up the general interest in the meetings.]

A recess, to terminate at 2 P.M., was ordered.

First Day—Afternoon Session.

On reassembling the President said that two papers having been presented on one subject they would be read consecutively and discussed jointly. The first, by Mr. G. W. Graeff, Jr., entitled—

GAS AND ELECTRICITY—TWO INTERESTS OR ONE?

is as follows:

The time has certainly come when the discussion of this question is imperative, and when it must be held with view to business prospects only. Prejudice and sentiment must alike be given to the winds, and the cold test of dollars and cents applied without fear or favor. The question is a business one solely.

Since the introduction of electric lighting as a means of artificial illumination, until within the past few months, there has been little between gas and electric interests in this country save direct and unreasonable antagonism. Some of the reasons are plain.

For many years gas had occupied the field as the general and practical artificial illuminant for domestic and commercial uses. From a small beginning the business grew into a settled and conservative industry, inferior in commercial importance and as a field of financial investment to the railroad and mining interests only. The combined capitalization of the gas companies of the United States runs high up into the hundreds of millions, as statistics easily show.

While in its earlier years the industry of gas manufacture met with many obstacles, and encountered conflicts and setbacks in its struggles for recognition and success in the business world, its growth has, altogether speaking, been rapid and enormous. With success, it became more and more conservative in its methods, and finally grew to look with anger and jealousy upon any proposed interference with what it considered its vested rights in the control and monopoly of the business of artificial illumination. It is not strange, therefore, that the introduction of the electric light, some half dozen years ago, met with jealous protest and vigorous objection from the gas fraternity. Nor were these sentiments subdued by the methods by which many of the electric light advocates endeavored to force their systems upon the public.

Like nearly all other inventions of promise, the electric light was seized upon by speculators, in many instances for the organization of companies that were thrown upon the public as ventures. Failures followed and were numerous, as was to be expected. On both sides of the Atlantic schemes, gigantic chiefly in their paper capitals, collapsed, and when inflated ventures came to grief the public was swift to condemn the entire industry as fraudulent, oftentimes to the great prejudice of earnest and honest men who were devoting time, talents, and money to the development of the new system, in endeavoring to place it upon a sound commercial basis.

Reasoning largely from the distrust of the unconcerned world, the concerned gas companies generally throughout the country became strongly imbued with prejudiced opposition to the new means of light, presenting the constant argument that the whole affair was a mass of gigantic scheming, unworthy of friendly consideration; while, on the other hand, its possible success meant the constant presence of a dangerous rival to the gas interests.

As if directly to increase this antagonism, many of the parent or manufacturing electric light companies persisted in exacting fabulous "stock concessions" and enormous profits upon sales of electric apparatus, for the rights to use their several systems. In this manner the local companies and users were handicapped with an enormously inflated capital stock, which rendered practically impossible the return of any profits to the legitimate investor, and, as a consequence, the business of electric lighting has been compelled to wade through a period of invention, development, scheming, and we might almost add, wholesale error, such as always attaches, in a greater or less degree, to the development of new and great enterprises wherein capital has to be sought from the world at large. The electric light manager who has labored earnestly and faithfully to reform the business from such abuses, and to place it upon a solid and legitimate commercial basis, has had neither a pleasant nor an easy task to perform, and has manifestly suffered from being considered to be in bad company.

During the past five years, invention has been an art assiduously plied, and the business has been greatly improved by a few earnest and determined men, who have loyally worked for legitimate development. Systems have been revised, apparatus has been improved and perfected, the cost of original production greatly reduced, and the prejudices of gas makers and their masters—the public—satisfied. The matter of electric lighting is now regarded generally by thoughtful business men as an established and honorable industry. Despite speculation, failures and the naturally expensive cost of development, the business has made its way from the realm of venture to that of at least moderate success.

The fact of this metamorphosis has greatly changed its relations to the whole commercial world. As a substantial and legitimate investment, there is now nothing that appeals with more force to capital, when organized upon a proper basis, unless it be the industry of gas manufacture. The combination of the two in one is irresistible.

To the gas companies of the country the electric light now occupies a higher and broader relation, and the more advanced of these have become satisfied that there should be no more antagonism between the two illuminants. They are either rivals or companions in trade, and the closer the association the better and more profitable for both interests, and for that other factor of importance to every gas manager—the consumer. The two methods should be combined and worked together in all cases wherein artificial illumination is supplied by a corporate or private concern. The reasons for such combinations are many and potent. I give a few:

Nearly every city and town in the civilized world, containing 10,000 inhabitants or upwards, has an established and successful gas plant. The organizations of these companies are complete. Their executive managements and labor system are in active operation. Generally such companies have a surplus of brain and sinew not taxed to full capacity to manage the company or operate the works. In a great number of cases, the gas company could operative an electric light plant with little or no extra expense for executive and manual labor. In many instances, hardly an additional man would be needed by an established gas company, in adding electric lighting to its business.

A majority of the gas companies have more land than is actually required for the operation of their works, and not infrequently surplus room in their buildings, that could be profitably occupied by an electric light plant. This would save all rent—an item that means from $250 to $2,500 per annum to the independent electric company.

Where a company has any difficulty in disposing of its coke at a fair figure, it can find a use for a goodly portion in the electric lighting service; and where coke meets with ready sale the employ of the quantities necessary for such fuel purposes would draw the line of demand more tightly and generally secure better prices for the portion sold. This, as a great soldier remarked of the tariff, is a local question.

A large proportion of the older gas companies have surplus earnings on hand sufficient to pay for an electric plant. This would enable the company to sell its electric light at a considerably reduced price from that necessarily charged by an independent company, the latter of which must earn dividends upon its capital stock, which will not average less than $20,000 to $30,000 for each 100 arc lamps it operates from a central station built upon modern principles. Where additional capital is required by the gas company, the amount would be far less than that needed by an independent electric light company. The cost of installation, and the saving thus made in organization and operation, would be sufficiently large to give the gas company enormous advantages over an independent organization. These advantages, in many instances, would include the declaring of dividends, when, upon the other side, none could be thought of.

It is not necessary to refer, save briefly, to the street lighting argument. It is acknowledged that arc lights in the streets cause increased use of gas for interior purposes. It is evident, therefore, that this arc lighting should be under the control of the party that is to benefit most from its use and efficiency. Again, it can scarcely be denied that for street lighting, where population is scattered, arcs are preferable to gas lamps. Long lines of pipe, for the simple purpose of supplying the street lamps, would not be necessary, wires being strung more cheaply than the pipe can be laid.

I do not think much of an argument presented to me yesterday, that gas companies generally take out their meters from premises wherein the electric light has been solely installed, unless paid rent for the use of said meters, and that this makes the consumer dependent upon the electric light at all times, thereby putting the electric lighting company to the expense of constant supply, and hence raising the cost "in the holder" of its light. I do not believe in taking meters out until the consumer orders them out, or until he becomes a radical opponent of the use of gas. The former is rarely the case, as there are few consumers who are willing to pin their entire faith to the supply of electric lighting from a central station; and the cheapest way to drive a customer to the other position mentioned is, in my opinion, to take out his meter. Even where the consumer seems wedded to the electric light, it is better to leave in his way the constant temptation to use gas, and to throw in his way the constant suggestion that there are ends to which gas may be consumed, other than the one purpose of illumination.

It has been suggested also, since arrival here, that, after all, the most powerful reason why the gas companies should adopt the electric light is that it will tend to make them popular. The matter of popularity is a perilous one. From the greatest of stories down to the humblest of circumstances over which the public hold control, the change from the cry of hosanna is an easy one; and especially so is the case in this country, where we have local reformers in every city, town and village, who are always seeking some Sindbad on whose neck to ride into temporary notoriety. I do not trust to popularity when, as has been the case within the past week, in my city, announcement of a reduction in the price of gas has been followed by the statement, in some of our largest dailies, that the meter wheels would now go round more rapidly than ever. While ignorance and vice go hand in hand, as they do in these cases, it is folly to dwell fondly upon the security of the bubble of popularity.

I am, too, more than ever convinced that popularity is but a bubble, since receiving the opinion of one of the best known members of the gas fraternity, a New York engineer whom all our Associations delight to honor, and who is supposed to hold the goodwill of the citizens and municipal authorities of his city by the most binding of ties. This gentleman stated to me, at the Boston meeting, that the chief reason why his company would not adopt the electric light until it was compelled to, was that it would tend to depopularize the company, and that he considered it much better to have the electric light as an open opponent than to have the gas company furnish it, and thus raise the public cry of "monopoly." At the same time, the gentleman named did not consider that the right to cry "monopoly" was furnished when his efforts kept a franchise from being granted to a rival gas company that proposed to enter his city, put up an expensive and permanent plant, and furnish, under guarantee, a gas of higher candle-power than did the company of which he has charge.

If there is anything in the cry of monopoly to fear, it will disappear when the consumer of light finds, as he must and will, that with the supply of electric lighting in the hands of the gas company he will secure better and cheaper service than is or can be possible under the present dual systems. Deeply rooted in the heart of the gas consumer, more firmly than his inherent love of opposition to the

powers that be, is his affection for his pocket-book, and the saving of the dollar is what will convince the consumer that the right course is being followed by a combination of the gas and electric interests.

I do not wish to be understood as indorsing the idea of better or cheaper illumination by means of the electric light. While this is generally admitted to be the case as concerned street lighting, I have never yet seen, nor do I soon expect to see the electric light that, for interior uses, will excel or seriously rival the Lungren burner. With the Wenham, to which our President flatteringly alluded in his addréss, this morning, I have little acquaintance; but am willing to accept his indorsement, which has no doubt been based on thorough examination and test. Nor do I ignore in favor of the electric light, the incandescent gas lamps that are now seeking the market. In at least two of these I have considerable faith, while the third is in hands that I feel will make a success of it. I do not ignore these weapons which the gas companies possess, or will possess, if a conflict of systems is to finally ensue. But I see clearly that the electric light is here and will stay here, as either for us or against us. Which is it to be? The consumer will demand the electric light—is now demanding it. Shall the gas companies comply with his desires and give him what he wants; or shall we tell him to go elsewhere for it? It is a poor grocer who sells sugar and refuses to handle cut loaf, because he imagines that he can compel his customers to take granulated or go to the "other corner." After a while they will go to the "other corner" too frequently for his enjoyment.

The question of fuel gas in connection with this subject of combined interest, is one of too much consequence to attempt to notice briefly; so I pass it by entirely, with the simple suggestion that the dovetailing of these interests, and the substantial aid in which the introduction of the electric light by the gas companies will give to the further use of gas for fuel purposes, is well worthy of more consideration than it has as yet received.

The question then is a plain one: With the knowledge that electric lighting has come to stay (and we might add in a broader sense that electricity has come to stay), and that it is growing to be more and more a commercial element, is it wise for the gas companies to leave its use, for good or ill, in the hands of those who have no interests in common with us? Is it not better that we should take it in hand, as an acknowledged ally and friend? It may be said that the gas companies of one State in the country have determined the ethics of this matter for themselves, and their example is worthy of imitation. Shall it be followed?

The second paper, by Mr. Thos. Wood, of Sandusky, on

GAS WITH ELECTRICITY,

is appended:

From the incorporation of "The London and Westminister Chartered Gas Light and Coke Company," in 1809, down to the present time, save the past two or three years, artificial gas has remained the most practical and advanced agent for illuminating purposes; and although its history, from its birth to the present time, is surrounded with opposition and bitter denunciation from the public at large, caused by actual or imaginary arbitrary dealings of the several companies engaged in the business, still we find its use has grown to proportions so large as to compel those engaged in its manufacture to believe that the industry cannot be materially affected by any rival which may appear in these times of new developments and inventions.

That the industry of gas making for artificial illumination will continue, no one will have a shadow of a doubt; but who can say that its rival, electricity, will not largely check the annual increase of output, which heretofore has been, with most of the larger companies, almost fabulous. It is true, we hear on all sides that in cities where electric light is supplied the gas companies sales have largely increased by reason of said electric plant; but is it an actual increase in dollars and cents? In other words, does the increase of output (if there be any) mean increase of profits? Have not prices been reduced to meet this rival, and in such proportion as to more than counterbalance any increase of output? Or, have not extensions been made into new districts and so brought the output up to its usual per centage of increase?

If such is not the case, and the same prices have been maintained as before the advent of electricity, and the increased output for the year still shows the same per centage as in previous years, then we must admit that electric lighting has made no inroads, or, at least, visible encroachments, on the gas business.

It seems to me these can hardly be the true facts of the case; for if (for argument's sake) we say a dozen of the best consumers of a gas company in a small city substitute the electric light for gas, it seems there must necessarily be a loss of so much gas sold, notwithstanding the fact that some others may burn enough more to make up the loss, even were the same prices maintained. That is to say, it is a loss in that this dozen consumers have practically abandoned gas for some other illuminating agent, and are no longer patrons of the gas company, except, perhaps, in a small way; while the chances are that other business men will be tempted eventually to do the same thing by force of rivalry.

Let a business man of any city, a jeweler, for instance, light his store with electric light and the other jewelers in that city will, in all probability, do the same, whether it be more economical or not; and so it is with the clothing business, or any other particular line.

Some gas men still assert that electric lighting is only a craze, that its life will be of short duration, and that gas will once more be universally used. In Murdoch's and his contemporaries time many said the same thing about gas; but the candle makers and whaling interests could not stay the gas craze. This contiuued harping about dangers and unreliability of electric lighting will not stop the craze; for do we not find that the introduction of gas met with these identical objections, all of which vanished as its use became more general; and why should not the use of electricity become safer the more we become familiar with it? History testifies to the fact that nearly all new inventions or departures have to pass through the ordeal of ridicule, discouragement, opposition and, often, loss before the world is willing to admit their stability—a good deal as the child has to battle with the measles, mumps, and whooping cough before becoming robust.

Electric lighting of to-day gives better satisfaction to the public than it did four years ago; and why should not improvements make it still better four years hence? That there are dangers connected with electric lighting it would be folly to contradict, but our own business of gas making is equally as dangerous, if certain methods of manipulation are not carried out. As the electric lighting becomes more general undoubtedly it will become more safe—as the demands of the public are invariably answered by the inventor, at least in this country.

Gas men have put too much stress on the dangers of electric lighting, as well as some other less founded arguments, much as drowning men are said to catch at straws; but it looks now as though gas men were getting bravely over their prejudice, and will soon take to electric lighting "like ducks to water," if it be only to keep up their reputation as monopolists. If you doubt this look back to the files of your periodicals devoted to the gas interests and you will find that gas men (and I will not omit the editors) have been letting themselves down gradually until to-day we find a great many of the former already running electric plants, and as many more about to do so; and the latter (I refer to the editors) advocating this action. And why should this not be so? Being in the lighting business they are supposed to respond to the public demand, and there is no reason why, if a sufficient number of their patrons desire electric light in preference to gas, or in conjunction with it, that the gas companies should not supply it, provided they can get a return on their investment; otherwise, others will come in and supply the demand. Supposing the case of a manfacturer who, for 20 years, has been making a special line of goods for a large customer is requested by that customer to change the pattern. Would you deem it business policy to let that customer for 20 years standing go elsewhere, rather than cater to his wishes? I think not.

If there are any who have not yet made up their minds that the electric light has come to stay, I think they had better do so at once, and look about them to find the best means and measures to prevent its introduction from injuring their present industry of gas making. Aside from the gas field there are undoubtedly in most cities localities where it is desirable and necessary that the electric light be used, and gas companies can just as well meet this demand as let others do it, for the reason that gas and electric lighting are coordinate branches of illumination, and there should be no hostility between the two—and there would not be, provided both are supplied at a fair compensation by the parties supplying these two kinds of illuminants.

Most of the gas companies of this country are no doubt heavily handicapped by reason of too large a capital stock to contend with

electric lighting with low priced gas, while others may be so placed that the selling price of gas is necessarily high as compared with some companies more favorably situated. The residuals of one company may be a drug, while with another they may be a large source of revenue; coal may be available at much cheaper rates in some places than others; and again, the nature of the soil may enter largely into the selling price of gas, as in the district represented by the writer, where every foot of trench for pipe laying has to be blasted.

Electric light companies, on the other hand, have none of these things to contend with, except in slight degree; and practically it costs about the same to erect and operate a plant in any two cities of same size. The capital required for an electric plant, including the construction of lines, etc., to cover same area as a gas plant naturally would, is less than one-half that required for a gas plant, thus enabling an electric light company to reach the heart of the gas consumption at a nominal expense compared to what it cost the gas company to lay mains to reach same point. Another advantage over a gas plant is the fact that an electric light plant can be transported to another city without much difficulty, if so desired, while the gas works of a town is a permanent fixture. I refer more particularly, in speaking of electric lighting, to the arc system, which undoubtedly has met with better commercial success generally than the incandescent, at least, up to the present time. My aim has been to point out some of the advantages an electric light company has over a long-established gas company; and I think you will find they are facts, whether we wish to believe them or not.

In the matter of enlargements of works or extensions of gas mains we know what radical changes and expenses said enlargements entail. Sometimes the whole system of pipes, purifiers, station meter, holders, etc., have to be substituted by larger at great cost. Old mains which have become too small have to be taken up and replaced by larger, when extensions into remote districts have to be made. Not so with electric lighting, as it is only necessary to add another engine, boiler, or dynamo alongside of those already in, when you wish to increase your capacity. The far future has not to be looked into so closely, and consequently capital additions need not be made until such time as a fair revenue can be earned on the expenditure.

A gas works when first built is usually built with a view to future growth, say to meet the demands for ten or fifteen years hence. There we have a large amount of capital lying idle for a number of years before it is needed; and at the end of this time what do we find? That the same process has to be gone through of providing for another fifteen or twenty years. More capital stock is usually sold to make the needed improvements, but just about this time a demand for a reduction in price is made, and we have this difficulty to contend with—capital stock increasing and selling prices decreasing in the same ratio.

The depreciation of the two respective plants the writer considers to be in favor of the electric plant, although there may be those who have good reasons for thinking otherwise. This point will depend largely upon the construction of the respective plants and methods of running same. That there is a disparagement in the footing of the two rivals, in favor of the electric plant as we find the two to-day, is evident to the writer; but whether the future will cause this difference to widen or narrow, time alone can demonstrate. Unquestionably those who are engaged in the gas business, and have this interest in charge, are capable of making, and will make, rapid strides of improvement in the future; but we must not lose sight of the fact that those who are working in the rival field (and they are legion) have, equally with the gas men, the capacity of attaining still better results.

The question arises, how can a gas company, thus handicapped, expect to hold its own against this rival in the field? Shall we make up the loss by making extensions into new territories, and make inroads on the gasoline field as the electric light has made inroads on our business? or shall we reduce the price (already low) and try to increase our output in this way as many have already done? or shall we take the bull by the horns and run an electric plant in combination with our gas business? If we do the first it will entail large expenditure for mains and services in districts sparsely settled, or where the consumers would probably be small ones—the street lamps are scarcely worth considering, as the profit accruing from this source is very small, after allowing for leakage and interest on the outlay; and besides, an electric light company can at any time reach this new district, and light it in one-tenth the time, and at one-tenth the cost for construction—in which case these new mains would be comparatively idle.

If we adopt the second measure, and reduce the price of gas with a view of inducing our customers to abandon the electric light, we must not forget that prices once reduced are seldom if ever recovered, and a reduction of ten per cent. in the receipts of a gas company is a reduction of ten per cent. forever.

Let us take the case of a small gas works, whose annual receipts for gas sold will amount to, say, *$40,000, with the further understanding that this company is selling gas at only a fair margin of profit, and that the works are conducted in an economical manner. The capital stock of this company would be, taking $5 per thousand of output as a basis, $125,000. An electric light company is about to be organized in same city, and with a view of heading it off a reduction of ten per cent. is made, which would represent a loss of $4,000 per annum, equivalent to nearly 3½ per cent. on amount of capital stock. But the reduction does not stay the operations of the electric light company, which goes on as if no reduction had been made, and the gas company finds itself out the $4,000 per annum, and an opponent in the field, working night and day trying to wean the gas company's best consumers away, and with a good measure of success, and with the resultant warfare between the two interests.

Now, supposing this same gas company in place of reducing the price of gas ten per cent. had put in a small electric plant of say 50 lights, which, in round figures, would have involved a total outlay of about $10,000, and supplied (before others came into the field) the demands of customers, its proprietors would have saved the $4,000 and invested it in something that would have given them equally as good returns as their gas interest, besides satisfying their patrons and averting war with a rival. They could have reached out into the gasoline district, and other places where gas had never been used, and solicited electric lighting where it did not conflict with the gas interest; and when the city desired to light all the streets with electric light they would be in shape to put in a bid. Then what profit there was in electric lighting the gas company would be making; and if, as so many claim, electric lighting assists the sale of gas, you could not fail to have a bonanza.

Considering what little profit there is in lighting our cities with gas, at present prices, the writer thinks it a great advantage to substitute the electric light for this purpose, thereby making available for private consumption a large surplus of capacity at the works, and thus enabling a company to put off for several years any large expense for improvement account.

In operating these two interests as one it should be borne in mind that the patrons of the combination must be made to feel it is to their interest as well as for your protection; and this can only be done by furnishing the light used, of whichever kind, at a reasonable compensation, and by giving them the best possible service. A company operating a combination plant can afford to supply the electric light to its patrons at a reduced rate over a company organized for that purpose alone, thereby enabling the combination the opportunity of proving itself a benefit to the public. That a gas company can operate the two systems with less expense goes without questioning; and if the time comes when electric wires will have to be placed underground the gas companies will still have other advantages. Usually there is sufficient land around a gas works to locate the electric plant on without additional outlay. The same officers can have supervision over both; and, in a great many cases, other labor can be utilized without additional cost. Waste heat from benches will form another important item of saving in the production of steam. Electric plants are not difficult things to manage or manipulate; construction of circuits and wiring of buildings is simple and easily acquired. Street men can be worked in to dig pole holes, and will soon learn the method of framing, raising and setting poles. As a matter of consequence the better the construction the better will be the service rendered, as in our gas business. Those who go into the electric light business in a slip-shod manner will find it a rough road to travel, and at the end of the year probably find nothing to compensate them for their pains. An electric plant to pay must be well planned, well built, and properly managed. No house-top or back-door construction work will give the patrons good service, but will only add to the dangers of the business. Good foundations should be placed under all machinery, if you wish to keep away from the repair shop, and everything must be kept in first-class order if we wish to make a success of it. A few words about construction of electric lines.

Of course you are all aware of the wide-spread prejudice which exists against the erection of poles in the streets of our cities, and there is, no doubt, just cause for this prejudice, owing to the indifferent manner in which the several line companies have done their work and neglected same after being built. Crooked and unsightly poles have been used where, at slight expense, better could have

*Presumed annual output 25 millions, gas rate, $1.60 per 1,000.

been employed. These poles are, in a great many cases, never painted, and utter disregard of neatness to coincide with the surroundings has been allowed—all of which has hastened public prejudice. If gas companies that are contemplating the addition of an electric plant would make a special effort in starting out with their construction, and endeavor to improve on the past methods by showing more regard for the tastes of the public in this matter, it would prove largely to their advantages to so do.

As an instance in point. Our company, after adding the electric lighting to its gas business, was caused a good deal of trouble in the matter of obtaining right of way for poles—it being necessary to erect poles on some streets where other companies had failed to get permission. It occurred to the writer that, perhaps, if iron poles were used this objection might be overcome, so permission was asked of the proper authorities and readily granted. These lines were built about a year ago, and have given excellent satisfaction not only to the citizens but to ourselves, for the wires have always worked well, and have not been the cause of a ground in that time, notwithstanding the fact that we have had some pretty severe storms since their erection. The poles are simply 2½ inch ordinary wrought iron gas pipe, with an eight inch flange, screwed on one end, to form a foot. On top is screwed a 2½x1¼ inch cross into which two pieces of 1¼ inch pipe (12 inches long) are inserted to form the arms. The outer ends of these arms are bitted with 1¼ inch Tees, into which are inserted the wooden pins that receive the glass insulators. If it is found necessary to put on more than two wires a 2½ inch nipple, 12 inches long, is screwed into top of the 2½ inch cross at top of pole, and another set of arms put on in the same manner as before. When these poles are painted they have a very neat appearance, and, practically, take up no room on the sidewalk. The method of setting these poles is simple. A man first marks out the distances at which the poles are to be separated, then, being careful that the marks are all on an even line, he takes an ordinary post-hole auger and bores out the hole to the depth of five feet, which, in favorable soil, is done very rapidly. A little soft water lime is thrown into the bottom of the hole, and the flange forming the foot is imbedded in its own weight, thus causing some of the water lime to be forced up into the pipes, which, when set, acts as a plug to keep water from getting up in the pipe. After the pole is plumbed the space around it is filled in with cement and broken stone, to the surface of the sidewalk. When the cement is set the pole is very firm and will not turn in the flange. Care must be taken not to run any wire until the cement is sufficiently set, which will occur in, say, two days. For neatness and strength combined they are just the thing, and a pedestrian will scarcely realize there is a line of poles on the street.

The height of these poles is 20 feet above the walk, and is ample to escape traffic, etc. This is a very convenient height for branching off into stores, and will bring the light wires below all telephone and telegraph lines, when crossing at right angles. The writer thinks that this height is preferable to using very high poles, and going over other wires, for various reasons—one is that electric wires need more careful and frequent inspection than any others; and at the height specified the examination can be made more readily and thoroughly. Another is that the branches going into stores are shorter, and any defect in these can be seen from the walk. Of course guard-wires are necessary when passing under other wires at right angles, so that any other line breaking will be caught before reaching the electric wires. In constructing electric light lines care must be taken to avoid running under and parallel with other wires, if possible; and another important point to be borne in mind is that a single electric wire running parallel with, although on opposite side of street to, a telephone line will render the telephones almost inoperative. If you wish to avoid trouble it is better to see that this mistake is not made on the start. A loop or double wire, on the other hand, will not affect the telephone line in the least, as the induction of the one wire is neutralized by the other. I mention these ideas of construction for the benefit of any gas men who contemplate adding an electric plant to their present works, believing and hoping that the experience of over a year may be of benefit and deter some of you from making costly mistakes in the start. While speaking of this experience a few words about the plant itself may be of interest to some.

In the first place, see to it that all your foundations are of the best. It will be better to exclude foundations when making contracts for engines, shafting, etc., and attend to that part of it yourselves. Buy the material yourselves, have the work done by the day, and stand guard over the workmen (with a club, if necessary), while the work proceeds. Anchor bolts for engine and pillow blocks should not be less than 9 feet in length, if you wish to keep everything solid and in line. Do not set dynamos on a floor depending on joists for support, but fill up space between joists with concrete, letting some extend down three or four feet into the ground. This done you can lay floor over concrete, and place dynamo carriage on this. By doing so you will prevent any vibration of dynamos or building while running. Let your engines be from a good maker, and, for economy, a slow speed engine is to be preferred, provided said engine has a sensitive and reliable automatic cut-off. From 120 to 140 revolutions per minute is a safe and economical speed, and you will find the repairs account on such an engine to be small as compared with high speed engines—the necessary speed of dynamos being acquired by using a pulley, of large diameter, on engine shaft, and belting direct to dynamo—counter-shafting makes things more complicated; extra bearings have to be looked after, and no floor space is gained; extra power is used up and, unless in particular instances, has nothing to recommend it.

In selecting belts always get the best the market will afford. They should be endless of double thickness, and perfectly straight. A cheap or low-priced belt is liable to prove a very expensive one in the end. An Ampère meter should be used for each dynamo, so that the operator can see at a glance what current the machine is sending out. This is just as essential as a pressure gauge at your gas works. Purchase always a good grade of carbons suitable for the size of your current, and keep your lamps properly adjusted at all times. If all these points are carried out you cannot fail to produce a light equal to the best in the country, provided, however, the system used is a meritorious one.

The boilers may be set in retort house so as to receive the benefit of all waste heat from benches. This will save to you more than 50 per cent. of fuel required, as if set independent of benches. Poor grades of fuel can be utilized, such as coke breeze, slack coal, coal tar, cannel coke, etc., and the ordinary firemen can fire the boilers without interfering with their other duties.

The pumps and injectors (there should be both), should be in charge of the engineer running the engines, who should have his steam gauge, water glass, and try-cocks close to his engine, in addition to the steam gauge and water glass in retort house.

Supposing this combination of gas and electric lighting under one management to be a settled fact, it will not do for such a company to sit quietly down and depend on the safety the combination apparently affords, but to instill further vigor in the task they have undertaken, and extend, push and improve the business with the idea of affording, as soon as practical, a means of reducing the price of both commodities to their patrons, thereby securing the moral support of the community by your endeavors.

I would suggest that gas companies having any remote idea of some day adding the electric lighting to their present business do so at once, even if there is only a small demand for same in the localities in which they are situated, for the reason that other promoters, ever on the alert, will discover that demand, and by working up that locality get enough others interested to warrant the putting in of an independent plant. The latter once in operation, and the stock held by your own citizens not interested in the gas supply, will necessarily engender an opposing faction, not of a foreign element, but a party made up of your own people, which you are aware constitutes the worst kind of opposition.

The plant need not be of large proportions to start with, but sufficient to supply the demands of those who are the most eager for the new light. By commencing early, and in this small way, you will be enabled to control the entire field, which should prove a benefit to your patrons and assuredly a protection to yourselves. If you are too tardy, and turn a deaf ear to the demands of the public, you cannot blame them if they welcome the arrival of some other promoters, after which you may find yourselves, by force of circumstances, compelled to put in an electric plant, and with the difference that there is a lively rival in the field who you will be obliged to buy out, at perhaps a high figure, if you wish to secure a clear field, thereby making the cost of your addition unnecessarily high on account of your tardiness.

(For some reason the subject of electric lighting has been, apparently, studiously avoided at the several Association meetings of late. Not even a war cry is heard, as in former years! What does it mean? Is it that gas men have tired of their sarcasm regarding the new light; or is it only a lull in hostilities, to be followed by more effectual action? I am inclined to believe this lull is simply time taken up to give gas men an opportunity of forming a new line of battle, whereby they may be enabled to capture the enemy's works and use them as their own defences. The fact that a bill to enable the gas companies of this State to combine and operate the two systems of illumination (it has already passed the Senate and will shortly come up for passage in the house) is indicative of this line of action.

To those who at the present time are averse to this innovation in the gas business I have no apologies to make, sincerely believing that it is only a matter of a short time when all gas companies, both great and small, from Maine to California, will be running electric light plants, and running them *well*. I also believe that in a short period of time this and kindred assemblies shall be known by the broad name of the "Artificial Light (I am emboldened enough to add) and Fuel Gas Association." Some one has written that "a rose would smell as sweet by any other name," and I think we will run no risk of injuring the smell of our gas by this change of name. The fact prompting the prediction of adding fuel gas to the combination grows out of the knowledge that the steam generated for electric lighting only occupies a portion of the 24 hours, and the same boilers can be used, during the balance of that time, for making water gas for fuel purposes, or, if desired, for illuminating purposes. The coke pile in that event will not be a source of worry, as it is to some at present.

Of course I refer to gas companies remote from natural gas fields, and localities where piping from these fields would make the cost of the gas to the consumer greater than it could be manufactured and sold at by a gas company. And if the supply from these gas wells should cease or get weak in the near future, as so many of our scientists predict, then my remarks would hold good for all gas companies.

Thanking you all for your patience in listening to my feeble efforts, I will close this paper by remarking that with gas light and gas motors, electric light and electric motors, and fuel gas, I conscientiously believe that the future of gas companies never looked brighter than in this year of our Lord, 1887.

[To be continued.]

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, March 10, 1887.

Gas Companies' Accounts for the Second Half of 1886.—*The Competition of Oil with Gas.—Sulphate of Ammonia as a Manure.—Dr. Knublauch's Experiments on Limed Coal for Gas Making.*

Now that the half-yearly meetings of shareholders have been held, and the directors of the various gas undertakings throughout the land have presented accounts of their stewardship during the six months, ended December 31st, 1886, we are in a position to notice the extent to which certain adverse circumstances, such as the fall in the value of residuals, the general slackness of trade, and the mild weather during the period in question, has affected the welfare of our industry. On the whole, the state of affairs is satisfactory. There are some unfortunate undertakings that have not been able to earn a sufficient balance of profit to make up the usual dividends, and are consequently obliged to draw on the reserve fund, or to resort to an increase in price. It will be interesting, by-the-way, to watch the effect of this policy on the quantity of gas consumed. It is so usual to look for an increase as an immediate result of a reduction in price that some curiosity is aroused as to whether the effect of a move in the opposite direction will cause any falling off in the consumption. But, while the reports of these undertakings are set in a minor key, and refer sadly to diminished receipts for residuals, a falling off in the consumption of gas, etc., there are many others tuned to a more cheerful strain. Not only has the balance of profit been maintained, but it is possible to announce further reductions in price in some cases. As an explanation of the apparent anomaly that some are able to reduce their price whilst others are obliged to raise it, we may notice that there is a great difference in the policy pursued in respect to various undertakings as to the adjustment of the price of gas. Some companies strain, perhaps, more than is good for them in the direction of "cheap gas." The moment their affairs admit of it a reduction is declared, perhaps without a proper appreciation of the fact that specially favorable circumstances have combined to produce a temporary inflation of prosperity. Sometimes we find even a step in advance of this, and there is a "reckoning of the chickens before they are hatched," by taking into consideration the increased consumption that may be expected to follow upon the reduction. Others are more cautious, and believing that a "bird in the hand is worth two in the bush," take care to have a good balance to the credit of individual profit before reducing their price. Sometimes the former policy is forced upon the directorate by adverse circumstances, such as excessive capital, etc. While fully believing in judicious enterprise, I would remind gas engineers that although reductions in price do not always meet with proper appreciation, any attempt to raise the price is sure to arouse opposition. A well-managed undertaking, having a capital account that has been kept within bounds, can usually afford to give a moderate reduction every few years as the business increases. This will be sufficient to show the consumers that their interests are not neglected, and that there is no desire to extract exorbitant profits; and will usually keep them more satisfied than a fluctuating price would. Such is the deduction to be drawn from the last six months' working. Those who sail too closely to the wind are the first to feel the effects of an adverse current; and so we find that some undertakings that have long been noted for cheap gas, and have consequently been as thorns in the sides of their less fortunate neighbors, are now unable to make both ends meet. The more cautious ones are able to pay their way comfortably, and perhaps to continue their custom in the matter of an occasional reduction, notwithstanding the unfavorable circumstances above mentioned.

An interesting report recently submitted to the Gas Committee at Dukinfield, where the gas works belong to the local authorities, by their manager, Mr. Harrison Veevers, affords some useful information of a novel character in connection with the supply of gas. It appears that the report is prepared in accordance with a desire expressed by the Committee some months since for information as to the various agents used for the production of artificial light in their district, having a special view to the effects of the increasing use of mineral oils on their undertaking. Mr. Veevers finds that, out of a total of 3,820 houses, 2,196 use gas, 1,600 oil, and 26 candles; and considers that the latter mode of illumination is not used to a sufficient extent to be of any practical consequence. But that oil is used in nearly 42 per cent. of the houses is regarded as an important matter, especially as there is reason to believe that its use is extending. Three causes are given in explanation of this. The first is that there is some dissatisfaction with the price charged for gas, because it is higher than the rate in force in a neighboring town. In the second place, oil is apparently cheaper because it can be purchased in small lots as required, whereas gas is paid for in a lump sum at the end of the quarter. And the third cause is the cost of fittings and meters. If the latter are not purchased, there is the rent to pay. In respect to the first cause, Mr. Veevers remarks that the loss on residuals, etc., has prevented reductions in price which otherwise might have been made. As to the second, which applies chiefly to that class of the community who are in receipt of weekly wages, he proposes that the gas bill should be payable, if desired, in four weekly installments, commencing from the day of its delivery. On the third head, he remarks that the cost of fittings, etc., for gas is certainly high, as compared with that of paraffine lamps, which may be purchased for a few shillings each. Hitherto it has been the general custom for owners of houses to fit them up with gasfittings, but since the use of paraffine has become prevalent there is a tendency to drop this rule. And if this should be done it will often happen that a person who would otherwise prefer to use gas would be debarred from doing so because of the expense of the fittings, which he would not be willing to incur. As some assistance in this direction, Mr. Veevers gives several reasons in favor of abolishing the charge for use of meters, and supplying meters gratis. The 1,600 houses at present using paraffine would consume, on an average, 3,000 cubic feet of gas each; and, therefore, if their custom could be secured the annual consumption would be increased to the extent of nearly 5,000,000 cubic feet. The present price of gas in Dukinfield is 3s. 4d. (80 cents) per thousand cubic feet. Reference is incidentally made to the advantage of letting gas stoves and engines on hire. Although much might be said as to the advantage of gas, and the trouble attendant upon the use of oil, it is considered that this aspect of the question does not receive much attention. It is regarded from a pecuniary point of view only, and as such must be faced by action bearing upon the cost of artificial light.

It would be idle to attempt to deny that the use of mineral oil has increased of late years, chiefly because it is so cheap. This, however, applies only to the working classes; for if tradesmen and middle-class people generally can obtain gas at anything like a reasonable price they prefer to use it, and thus avoid the many risks and difficulties attendant upon the use of oil lamps. The oils which are offered at temptingly cheap prices are not altogether satisfactory in respect to purity. While there are few towns in England where the competition of oil has affected the gas supply to the extent that appears to have obtained at Dukinfield, it is well that the subjects treated in Mr. Veever's report should be duly appreciated. We may certainly point to the increased use of gas that has prevailed of late years as a conclusive sign that there is no cause for alarm; but, on the other hand, it is worth while to examine our books, with a view of ascertaining whether the increased use of gas stoves and gas engines may have served to cover any derelictions in the direction of the paraffine lamp.

One of the papers devoted to agricultural interests publishes a letter from Mr. E. W. Booth, the steward of a large estate situated a few miles from London, on the value of sulphate of ammonia as a manure for grass land. After trying bones and various other artificial manures with but little if any benefit, Mr. Booth tried the following mixture: One ton of sulphate, two tons of mineral superphosphates (coprolites) mixed with an equal bulk of fine soil, and sown upon the land during the last week in March, at the rate of 1 cwt. of sulphate to 2 cwt. of superphosphate per acre. This mixture was a decided success. All through the growing season it was easy to see where the mixture had been used, and on cutting the crop there was found to be a large increase in produce as compared with ground treated in other ways. The inclusive cost of purchasing and applying the mixture is estimated at about 21s. per acre, and the increase in produce so secured is valued at double this cost. Mr. Booth's experience agrees with other large agriculturists who have found that sulphate is preferable to nitrate of soda for mixing with phosphates and other mineral agents. And it is generally admitted that the best results are secured from mixtures which are capable of supplying the plant not only with nitrogenous matter, but also with phosphorus, lime, potash, and other necessary mineral ingredients. Mr. Martin, engineer and manager of the Barnet District Gas and Water Company, who supplied the sulphate for the experiment, is very wisely making use of Mr. Booth's testimony to the value of sulphate by having it reprinted in leaflet form and circulating it amongst possible users in his neighborhood. I hope the time will soon come when agriculturists will be sufficiently awake to their own interests to avoid the heavy expense of the carriage of manures from foreign ports by using that which is to be found close at hand.

Speaking of sulphate reminds me that there are several encouraging signs that the depression in the residual market has touched bottom, and that things are beginning to move the other way. Both tar and liquor are improving in value, sulphate having stood at something closely approaching £12 per ton for some time, whilst better prices are also obtainable for tar. Although it is not anticipated that the prices of 1881 and 1882 will ever be reached again, there is good reason to hope that the item "residual products" will assist the revenue of gas undertakings to a larger extent during the year 1887 than it has done during the year just closed.

Dr. Knublauch, the chemist to the Cologne Gas and Water Works, has been trying some experiments on the effect of mixing dry substances (especially lime) with the coal to be used for gas making; his attention having been drawn to the subject by the application of the Cooper coal liming

process in England. He finds that, working on a small experimental scale, the effect of uniting 2½ per cent. of lime with the coal is to increase the quantity of gas to the extent of 5 per cent., but there is also a corresponding decrease in quality. This also applies to the coke, which is of course increased by the weight of the lime, but does not burn so well as the unlimed coke. The tar is poorer in quality and 10 per cent. less in quantity, but the ammonia is increased in about the proportion of 10 per cent. The production of sulphuretted hydrogen is diminished, and, on account of the increased quantity of ammonia, a larger portion is removed in the scrubbing and washing apparatus; and both these circumstances tend to reduce the amount of work remaining to be done in the oxide purifiers. But the carbonic acid is increased to the extent of 10 per cent.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

The Breckenridge Cannel Deliveries.—Gas men throughout the country are naturally somewhat puzzled over the legal aspect of the Breckenridge cannel situation. The lawyers, the judges, and the proprietors (both American and English) seem disposed to make a football of this valuable Kentucky property; but the users of the product need have no fear as to deliveries of the cannel—in testimony whereof we submit the following, from an entirely authentic source: The application of the Kentucky stockholders in the Breckenridge Company (Limited) to the Circuit Court of the United States, at Louisville, has been granted. On Feb. 8 Graham Macfarlane, who, up to that time, had been acting as Superintendent and Agent of the colliery, was made Receiver, with power to authorize contracts for the current year. The position of Sales Agents for this cannel, which Messrs. Perkins & Co., of New York city, had occupied under the former management, has been continued by the Receiver above named. A formal decision upon the points in question between the American and English stockholders is expected in June next. All sales and engagements for cannel made under the Receivership will be carried out by *any* management which *may follow that decision.*

It was the Electric Light Company.—In our last issue we stated that the stockholders of the McKeesport (Pa.) Gas Light Company, believing that the high salaries paid the officers of the Company were absorbing the profits, were about to bring suit with the object of compelling the directors to open the books for inspection. The assertion was incorrect, and should have read the "McKeesport Electric Light Company" instead. The McKeesport gas investors are satisfied in all respects, both in the matter of management and returns. Mr. Wm. C. Neemes, Superintendent of the Gas Company, writes us that the residents who have tried the incandescent lamps are greatly disappointed with them. In fact, the greater number of those who tried the electric lighting plan have already returned to the use of gas.

More Contracts for Mr. Weber.—Mr. Adam Weber, of the Manhattan Firebrick Works, this city, informs us that he has secured the following contracts: To furnish the Citizens Gas Company, Rochester, N. Y., with all the necessary fireclay materials for 6 benches of sixes, the same to be fired with the new and improved half-depth Weber regenerative furnaces; and to construct 2 benches of threes (under conditions similar to the Rochester contract) at the works of the Glens Falls (N. Y.) Gas Light Company.

Taxes with a Vengeance.—Mr. E. H. Jenkins, the go-ahead gentleman who superintends the business of the Columbus (Ga.) Gas Light Company, writes: "I notice an item in your valuable Journal the tenor of which leads me to infer you think it strange that the authorities of Virginia City (Nev.) should wish to impose a special tax on gas companies. I herewith send you a copy of the tax ordinance of Columbus, and from it you will see how nicely we are taken care of by our City Fathers." [From an examination of the ordinance we find (1) that gas companies are obliged to pay into the city treasury, each year, one per cent. of their gross receipts. The method of enforcing payment, *vide* the words of the ordinance, is as follows: "If any persons, firm or corporation shall fail to make a return of their sales, earnings, and receipts as required above, within ten days after the 1st days of January, April, July, and October respectively, they shall be summoned before the Mayor's Court, and shall be liable to a fine of $10 for each day's default thereafter, in the discretion of the Mayor; and if any person, firm, or corporation shall make a return which, in the judgment of the Finance Committee, is considerably less than should be returned, the Committee shall assess such amount as they may deem just, and, if the party so assessed shall object to such assessment, they may produce their books, and the whole matter be referred to Council for their determination." In another section we find, under the heading of "special tax," that each electric light company shall pay an annual license fee of $25; but each gas company must pay $100 per annum—they ask pawnbrokers to pay only $150—in advance. Plumbers must pay $25; and in addition "every plumber and gas or water fitter, or firm or corporation engaged in the work of laying pipe, shall, by the first day of March, make and file with the Clerk of Council a bond in the sum of $1,000," etc.] Taking up the thread of Mr. Jenkins's letter, he further writes: "Notwithstanding the zealous care exercised over us, during the past year we have been enabled to pay a 6 per cent. dividend, and, in addition, to expend about $3,500 in extensions, etc. Our annual output is about 10 million cubic feet. Our leakage account (1,389,000 cubic feet in 1885) has been brought to 1,005,000, or an average of 10.27 per cent. Our consumer's list shows, for year, an increase of 16 per cent., and we made a 10 per cent. reduction in our selling rates. So, you see, we are not only alive but prospering, as we are glad to know is the case with a majority of our brethren in the gas business." We did think it strange that Nevada City should attempt to tax any manufacturing company (gas or otherwise) in the manner proposed; but our impression was tempered somewhat in the understanding that Nevada City was in a pretty bad way for money, and had to have it by hook or crook. Georgia, however, it is popularly supposed in this locality, is anxious to attract Eastern capital—but, come to think of it, Columbus may bear a relation to the rest of Georgia similar to that existing between Canarsie and the balance of the Empire State. The leakage account returned by Mr. Jenkins will have especial interest if one remembers the paper read by him at the last meeting of the Western Gas Association (it will be found in our issue of July 2, 1886, p. 3) on his initial experience at the Columbus works. Without going into any extended mention of the facts, we may explain that when Mr. Jenkins took hold of the Columbus plant he found that (on a total make of 9 millions) in 1883 the leakage account had averaged 27.3 per cent. In view of his returns under that head for 1886, we submit that the salary paid him cannot be considered a heavy burden by the owners of the Columbus works.

The Minneapolis (Minn.) Explosion.—About three weeks ago the Associated Press despatches conveyed the news that an explosion at the Minneapolis gas works had caused serious loss to life and property. As usual, the Associated folks managed to get matters pretty badly mixed, and in order to secure trustworthy information about the disaster we applied to a gentleman connected with the Company for details of the affair. Through his courteous attention we are enabled to present the following: "The explosion occurred at about 4:30 P. M. of March 11th, and it is really strange that its effect was not more serious. It occurred in a scrubber, but recently constructed, built of one-quarter inch boiler iron, 6 feet in diameter and 20 feet high. A diaphragm divided it into two compartments, and a 20-inch outlet at the left connected it with a similarly-sized tubular condenser. The scrubber was filled with 4 in. by 4 in. lumber, cut in blocks 8 inches in length, and separated by a space of 1½ inches. In ordinary working—that is, when gas was being manufactured—the gas would enter at the left, and base, ascending and passing down and out, at the right and bottom, through a 20-inch valve, thence through about 130 feet of pipe on to our coal gas pipes, which latter were fitted with a second valve. At the time of the explosion both these valves were shut. To begin with—this water gas plant is not yet completed, consequently it is in the contractor's hands—a mechanic and his helper, who had been employed for the day from a neighboring shop, were fitting a smooth-faced door on the left of the scrubber. Needing the aid of a light for the purpose in view, one of them (the mechanic) ignited a match, and as he did so the explosion occurred. The door swung back and broke his skull—the unfortunate man died the next day—and the helper was burned somewhat, not seriously, however. The shock tore out a piece (2 ft. by 4 ft.) from the middle of the right compartment of scrubber, swinging it back like a door, and the blocks were thrown out promiscuously, striking many people in their flight. The cover, of steel plate, 6 feet 4 inches in diameter and ¼-inch thick, broke loose from the *condenser*—it carried 54 five-eighth-inch bolts with it—sailed through the iron roof of the building (breaking off a heavy T-beam), and ascended into the outer air for perhaps 70 feet. In descending it crashed through the other side of the peak of the roof and onto one of the 11-foot cupolas on which five men were at work finishing up the lining. The falling plate hit one man—a brick mason, who lived but a short time after receiving the blow—and lodged on the cupola top as if placed there by hand. The damage to buildings and scrubber is but trifling, and were it not for the loss of two human lives—good men and mechanics—the affair would not be thought much of. The coroners inquest lasted two days, and the verdict was, 'Caused by a gas explosion.' We are yet at a loss to determine the cause of the disaster, and have no 'theory' to advance. We had made no gas as yet in the works; both valves were closed tight at our works and water gas plant. These are the facts just as they happened; and as the new plant is not yet ours, we do not consider it our disaster, nor do we place any blame."

The Manufacture of Purifier Trays.—The tray business is more of an undertaking than most gas men suppose. At the establishment of Mr. Jno. Cabot, Nos. 306 to 310 Eleventh avenue, this city, where the manufacture of

trays is carried on exclusively, at least six workmen are constantly employed, that number being, of course, largely exceeded during the busy season. Special machinery is used to further the work, and trays of all sorts—for scrubbers as well as purifiers—are turned out in large quantities. Mr. Cabot reports sales, in last year, to over 100 gas companies, and he also notes that thus far the inquiries for current year greatly exceed those of the same period in 1886. The old motto, "The best is the cheapest," seems to apply to tray work; and there can be no doubt that the Church tray is meeting with phenomenal success. Orders for it are received from all parts of the world; and England has proved such an exceptionally good field that an agency has been established there. The essentials of a tray are that it shall be strong, light, retain its shape in use, not obstruct the flow of gas, and, withal, be easily repaired. These points seem to be covered by the Church style, and therefore it has met with deserved success. Mr. Cabot does not sit still with the advent of new methods of purification, for he has devised a tray, having rectangular slats, to be used where iron sponge is employed as the purifying agent. The new specimen, by means of an ingeniously-devised plan of grooving the exposed surface of the slat, holds the iron in such way as to prevent it from sifting through—a cause for complaint in the old-style tray. The trays are now fitted with three malleable iron cross-bars—one in center and one on each end—thus protecting the ends of the slats from breaking. Mr. Cabot's work is well known for its good quality, and to that feature much of his success is due.

Cheaper Gas for Dallas, Texas.—Not long ago we published in these columns some account of the manner in which Brother Enfield was "carrying on" in his portion of the Lone Star State, and we are right pleased to be in position now to say that Dallas gas matters are enjoying a genuine "boom." Some time since the proprietors of the Dallas City Gas Company published the news that from and after April 1st the net rate would be reduced to $2.50 per thousand cubic feet, provided accounts were settled within eight days from date of presentation. At the same time they gave notification that the officers of the Company were ready to receive communications, to promptly answer all inquiries leading to the introduction or extension of the use of gas in stores and dwellings, and, if necessary, would send an agent to confer with those so asking. The notice closed with the intimation that "Gas fitting would be done at cost," and that "gas fixtures would be sold at a discount." The result of the pronunciamento has been such that, on date of March 15, or 16 days before the new scale would go into effect, Brother Enfield had for days back been putting in an average of two new meters per diem, and three gas fitters were working overtime in the attempt to keep up with the demands of those who wished to have their houses piped. In his courteous note to us on the subject Mr. Enfield says: "Our people are pleased with the prospect; and I might add so also am I." The new Dallas rate is quite a cheap one, and the local gas proprietors will have no reason to repent of their move. The former gross rate was $3.30; net, $3.

Cheaper Gas for Scranton, Pa.—We are indebted to Mr. G. B. Hand, Secretary of the Scranton Gas and Water and the Hyde Park Gas Companies, for a copy of the following, which bears date of March 10, 1887: "In pursuance of the policy of these Companies to reduce rates from time to time, as may be warranted by increased consumption, notice is hereby given that from April 1st, 1887, the price of gas will be $1.40 per thousand cubic feet, subject to the following discounts: 5 per cent. on all bills where the consumption for the month amounts to less than $10; 10 per cent. on all bills amounting to $10; 15 per cent. on all monthly bills amounting to $25 and over—provided the bill is paid on or before the 20th of the month in which it is presented."

Changes at Wilmington, N. C.—It was not a great while ago when the Wilmington gas folks were distilling wood, but the process, besides being decidedly uneconomical, gave poor satisfaction to the consumers. When the change to coal was made the business of the Company rapidly increased, and with that accession came the necessity for enlarging the plant. The improvements and extensions have been carried along without haste, but now the work is nearing completion. A stack of fives has been added to the carbonizing capacity, and the retort house now can be depended upon to produce 130,000 cubic feet per diem. Messrs. Gautier & Co., of Jersey City, N. J., supplied the retorts and fireclay material. A holder, located in the vicinity of Surrey, Castle, and Front streets, calculated to store 66,000 cubic feet, is now in process of erection, and when completed the Wilmington Company will have remedied one of the most harassing features connected with its former supply conditions. About 1,200 tons of coal are annually carbonized at Wilmington, some Pictou coal being included; which is strange when one considers the ease of securing Kanawha coal at that point. The business of the Company steadily prospers, and its proprietors are to be congratulated on having enlisted the services of two energetic men, in the respective persons of Secretary and Treasurer R. J. Jones, and Superintendent J. W. Reilly.

Santa Ana (Cal.) has a Gas Company.—The Santa Ana Gas Company was incorporated in 1886, with a capital of $50,000. It is officered as follows: President, N. Palmer; Vice-Pres., C. W. Humphreys; Secy., M. A. Dunham; Treas., W. S. Bartlett. Santa Ana is in that most beautiful, fertile, and fragrant garden spot of California contained within the boundaries of Los Angeles county, at a point about 6 miles south of Anaheim (the latter is located on the Santa Ana river, some 8 miles from the sea and 25 miles southeast of Los Angeles.) Santa Ana is the center of a rapidly developing agricultural district, and is bound to become a most important flour milling district. In 1870 the post village contained but 750 souls, whereas now it can be depended upon to afford plenty of business to those interested in dispensing the light of the present.

In the Hands of the Judges.—The Worcester (Mass.) gas hearing before the State Gas Commission, according to the testimony, seems to have been in the nature of a tempest in a teapot. We fail to see, as said before by us, that the complainants made out any sort of a case, save perhaps in the item of a deficiency in the Worcester Company's distribution system in one or two sections of the city. It is about time that the owners of large factory buildings comprehended the fact that a half-inch riser cannot be "depended upon" to supply a sufficiency of gas to 100 gas burners, be the latter ever so small. Even admitting that some 700 or 800 feet of the Worcester Company's main pipe was of improper diameter, their sin is but trifling when placed in comparison with the plumbing practice of some of the complainants' witnesses. It is expected that the Commission will shortly render a decision. Until that is made public we refrain from further comment.

Chartered at Leavenworth, Kansas.—It is understood that, on March 22, the City Council of Leavenworth, Kan., passed an ordinance chartering the Leavenworth Lighting and Heating Company. It is further reported that Mr. Socrates Newman, of St. Louis, Mo., is the one most interested in the venture.

Street Lighting at Newport, R. I.—In response to the invitation of the Committee on Street Lights of the Newport City Council, the Newport Gas Light Company, through Treasurer Quinn, submitted the following: Not less than 350 street lamps, including lighting and cleaning, at the rate of $1.80 per thousand cubic feet; but if 600 lamps be maintained, the charge to be reduced to $1.50 per thousand. Gas supplied to public buildings to be at the rate of $1.70 per thousand. Last year five miles of Newport's streets were lighted by electricity at a total cost of $15,421.46; whereas 30 miles of street gas lighting cost but $7,740.67. An average cost per mile, for the former, of $3,084.35, against $258.02 for the latter. It costs something to be fashionable.

Changed Hands.—Messrs. E. T. Watkins, Theo. Forstall, L. Z. Leiter, A. Keep, Y. L. Yoe, J. N. Jewett, S. B. Cobb, J. Beecher, B. L. Smith, J. A. Brown, Jr., and J. de Koven, in March last resigned their positions as Directors in the Chicago Gas Light and Coke Company. Messrs. C. R. Cummings, S. A. Kent, J. Cohrs, C. T. Yerkes, P. A. B. Widener, W. L. Elkins, W. C. Goudy, Theo. Forstall, and J. Rehm were thereupon elected to the vacancies, and the Philadelphia syndicate were thus put in control of their new purchase. The new management subsequently elected Mr. Theo. Forstall to the office of President of the Company. It is understood that the schedule of rates will be revised, but it is not surmised that the new price will be other than an equitable one.

Death of Mr. Sherwood.—Mr. John H. Sherwood, who will be remembered by the gas makers of this city for many a day, died at his home on the morning of March 17. Deceased was a native of New York, was born in 1816, and had amassed a large fortune in various mercantile pursuits. Personally, he was well liked. He was one of the original founders of the *Sun* newspaper. He had held many important positions in financial institutions, and was a great believer in the value of New York city real estate.

Not Unlawful to Boycott a Gas Company.—The London *Economist* says that a curious suit has just been heard before a Paris (France) civil court. The gas company which supplies the town of Rambouillet having refused to reduce its price, a great number of the inhabitants entered into a compact to abstain from burning gas, and imposed a penalty on any members of the league who should secede from the agreement. The company brought a test action against one of the members, claiming damages for an illegal coalition, pretending that it was an infringement on the liberty of trade, but failed, as the court held it had not been proved that any unlawful coercive means had been exercised on any individual member.

To Build a Holder.—The Washington (D. C.) Gas Light Company has applied for permission to locate a gasholder tank in "Square No. 1,020," the excavation to be 140 feet in diameter and 30 feet in depth. This looks as if the Washington folks were about to construct another big gasholder.

The Baltimore (Md.) Gas War.—Another sortie has taken place in the Baltimore gas siege. The Equitable Company announces a reduction to 35 cents per thousand cubic feet, and much confusion is the result. It would seem rather illogical, in the face of this move, to predict that the end of the Baltimore gas war draws nigh; but, illogically or otherwise, we nevertheless incline to the belief that those who purchase Baltimore gas shares at current rates will have no reason to look forward to a spell on the stool of repentance.

Extending its Sphere.—The Clinton (Mass.) Gas Light Company asks permission to increase its capital stock in order that it may supply gas to the inhabitants of the neighboring town of Lancaster.

Gone To ——?—Walter E. Lawton, formerly of this city, is an object of extreme solicitude to many hereabout and elsewhere. Of course, we refer to the party who left New York rather suddenly, leaving debts to the tune of a million or over. The absconder was the leading spirit in the Gate City Gas Company, of Atlanta, Ga., and we opine he did not find much profit in the venture. Brother Helme, of the old Atlanta Gas Company, is evidently a good fighter. [The Company has been placed in the hands of a receiver.]

Hartford (Conn.) Notes.—Gas at $1.40 per thousand is pretty cheap when one considers the situation and surroundings at Hartford, and shows how progressive the management of the Company has been. But Brother Harbison is not yet satisfied, for he means to come down once more in the near future. In order to accomplish this object extensive alterations are now in progress at the Hartford works, one of the principal items being the construction of a new retort house on the site of the carbonizing plant dismantled some years ago. To secure a firm foundation for the new structure some 800 piles had to be driven. The house will contain eighteen benches of sixes, to be fired on the regenerative principle, and it is fully expected that by the 1st of September the plant will be in working order. The new Standard Washer-Scrubber was put in duty about two weeks ago, and is giving satisfaction. In 1878 the Hartford rate averaged $2.61¼ per thousand; and the present conundrum is, what will the decennary of that year disclose in the matter of selling price? We might also note that the petition of the Hartford Company to the Legislature asking permission for a charter amendment to enable the Company to supply electric lighting, was, on March 23, favorably reported on by the Senate Committee.

He did not Mean it.—About ten days ago the New Orleans *Picayune* contained a statement by a merchant of that city who claimed he had, some years ago, been presented by the Gas Company with a bill for $62 on account of a month's gas supply. He paid the bill under protest, and asked the Company to give him a new meter, which was done. Next month the inspector called, looked at the meter, and said, "No gas burned this month, eh?" The merchant made no reply. A similar state of affairs went on for a year or so, when the merchant told the inspector "that he had been using gas all along, but guessed the meter didn't register it." The story is remarkably diaphanous, nevertheless the *Picayune* man took it all in, as did other newspapers, who reprinted the "confession" as an instance of Crescent City shrewdness. Some days after the merchant acknowledged he had only been hocussing a reporter; and the inference, at this distance, is that the merchant had been drinking levee water. Now let us see if the newspapers which circulated the "confession" will devote equal space to the recantation.

Correspondence

[The Journal is not responsible for the opinions expressed by correspondents.]

A Dissenting Opinion from Cadiz.

Office of Gas Works, Cadiz, Spain, Feb. 28, 1887.

To the Editor American Gas Light Journal:

Having read in your Journal (issue of Nov. 16, 1886, p. 296) Mr. Mayer's paper on the Munich regenerative bench, I ask that you kindly give space to the following.

For about 30 years the people of Cadiz were supplied with gas from a works built by French capitalists. Originally the price charged was at the rate of 34 centimes per cubic meter, subsequently at 28 centimes, or about $1.95 and $1.61 per thousand cubic feet. The illuminating power was unsatisfactory, and the street mains—these were of sheet iron covered with asphalt—were so imperfect that, under moderate pressure, over 30 per cent. of the gas was lost through leakage. The purification was wretched and the service abominable. No wonder, then, that loud complaint was made by the consumers; but the French capitalists, refusing to take measures to abate the trouble, were soon rudely disturbed. Several prominent residents of the city organized a gas company, capitalized in one million pesetas (about $200,000), and asked for bids for the erection of a thoroughly equipped modern gas plant. In response 18 tenders were received. Preliminary examination resulted in the rejection of six of these; the second scrutiny brought the number to five; the third reduced it to three. Of these that submitted by the firm of Aug. Klonne, Dortmund, Germany, was determined upon. In the opinion of the committee the Klonne proposition best met their ideas in regard to practical arrangement and details of construction. The awarding of the contract was also influenced by a statement of the magnificent results obtained in many gas works where the Klonne furnace was in operation.

The Messrs. Klonne completed their contract in due time; and as I was appointed to the superintendency of the new Cadiz plant, I beg leave to submit the following statement (average for three months) of the results obtained:

Yield of gas per ton (2,240 pounds) of coal carbonized..	10,753 cu. ft.
Yield of coke per ton.....	1,568 lbs.
Coke used as fuel per 100 pounds of coal carbonized...	10.653 lbs.

The Klonne furnaces not only offer all the advantages of the Munich ones, but are more simple. Their generator, placed immediately under the retort bed, and not projecting beyond the front walls of the bench, is better liked by the men, on account of its lack of bad effect on their systems. In that respect it is superior to the Munich practice.

The Klonne regeneration occurs on each side of the generator, and is so arranged that the waste gases are traversed, horizontally, on their straight, downward curve, through the entire depth of the bench, by the secondary as well as the primary air, in ziz-zag passages. The air absorbs completely the heat of the waste gases, which latter enter the main flue quite black and cool.

The carbonic oxide produced in the generator enters the interior of the generator arch, and combines in combustion with the previously heated air from the regenerator. By this means the generator is worked comparatively cool. The intense heat being created on the outside of the generator only, the latter will in consequence last as long as the arches of the ovens, and so require no repairs of any kind. The regenerator, being of substantial construction, will even outlast the generator, the recuperator bricks being so connected as to preclude the possibility of their cracking and allowing the gas to pass through the joints. Taking into consideration that the generator is below the retort beds, radiation of heat is wholly avoided. The entire front of the oven is easily accessible, which facilitates the attendance. In favorable contrast to all other systems these furnaces can be approached without the slightest discomfort, on account of heat, and the stokers are not subjected to the danger and annoyance from contact with radiated heat, escaping carbonic oxide, or the combustion products from the generator, the contrary being the case in the Munich furnace.

To clearly comprehend the Munich results given in your Journal it is necessary to understand that Saar coal (which was worked in the Munich reported tests) is very easily carbonized. That coal would require the aid of but from 7 to 9 per cent. of fuel when carbonizing by the Klonne plan; also Bohemian coal, which requires the use of 6 to 8 per cent. of fuel. On the other hand, Westphalian coal takes up about 14 per cent., and the Silesian variety absorbs from 12 to 13 per cent. of fuel. In consequence the Munich figures are, in a certain sense, misleading.

In the matter of the illuminating powers of the gases made under the two systems, the Klonne special arrangement for passing the gases from the mouthpieces at a moderate temperature yields an increase of at least two candles over that afforded by any other furnace systems. In estimating the durability of the furnaces one must not only regard the quantity but also the quality of the coal carbonized; for from the figures above given, 2,000 days' working on Saar coal will not be equal to 1,000 days with the Westphalia variety. The English *Journal of Gas Lighting* (June 22, 1886, p. 1196) states that certain Klonne furnaces, after 731 days' working, were, upon careful examination, found to be as good as when first started; further, that the entire extra cost of the Klonne construction had, by reason of the extra saving in fuel secured, been completely neutralized in the first 271 days of working. In fact experience has proved beyond doubt that, in the hands of a practical gas maker, the Klonne furnaces present no difficulties whatever. At the Hanover works (owned by the Imperial Continental Company) the Klonne furnaces, carbonizing Westphalian coal, had been operated for 1,100 days without any need for repairs. I believe that between 15 and 20 thousand retorts are now working under the Klonne plan in Europe and America, the most notable instances in your country being at Newark, Philadelphia, Milwaukee and Chicago.

The Klonne hydraulic-main-washer-condenser, intended to prevent stoppages in ascension pipes, and the deposit of pitch in the hydraulic main, was described in the issue of your Journal, dated Nov. 2, 1886. In this letter I state facts and actual results obtained by me in the practice of my profession.

Yours truly, W. Klein.

The Market for Gas Securities.

The city gas share market may be written down as dull and strong. Consolidated sold up to 85¼; Equitable ranged between 125 and 130; and Mutual ruled strong at 103 to 105. The financial agents of the proposed Standard Gas Light Company report a fair inquiry for their specialty; but, even at best, this security seems to hang fire. In Brooklyn shares a firmer feeling prevails. The Brooklyn Citizens Company will, on May 1st, retire the present issue of 10-20 seven per cent. sinking fund bonds, and substitute therefor an equal amount of fives, redeemable at option of Company on six months' notice. That substitution will hardly meet with favor on the part of the original holders. The Brooklyn situation, in the matter of gas legislation, is still badly mixed, but must soon be decided one way or the other. Holders do not seem greatly disturbed at the prospect. The Baltimore situation is further entangled by the Equitable reduction to 35 cents per thousand, but insiders predict that now is the time to buy Baltimore gas shares. Talking of "legitimately" cheap gas reminds us that the Dayton (Ohio) Company will, from 1st inst., institute a net rate of $1.15 per thousand. No new developments in the Chicago transfer.

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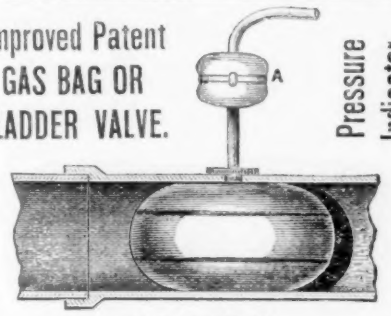

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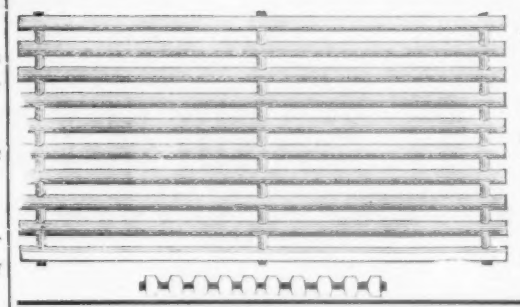

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Ferric Oxide, as ground, screened, and prepared by me for purifying purposes, has now been in use for several years by many of the gas works throughout the country, including Detroit, Chicago, Milwaukee, East Saginaw, Burlington (Iowa), Ann Arbor, etc. It has proved, as I believe, the **Most Effective and Economical Agent** now in use. I am prepared to furnish the Oxide by the 100 lbs. or in car load lots, and will be pleased to give price f.o.b. cars at Ann Arbor or at place of destination. Address

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THE KERR MURRAY MANUFACTURING COMPANY,

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CONSTRUCTING ENGINEERS AND BUILDERS OF

GAS WORKS AND HOLDERS.

Drawings, Estimates, and Specifications Furnished for the Construction of New and the Rebuilding of Old Works.

MANUFACTURERS OF LATEST IMPROVED APPARATUS FOR COMPLETE AND AUXILIARY OIL AND WATER GAS PLANTS.

Rotary and Steam Jet Exhausters, Rotary Washers, Self-Sealing Mouthpieces,

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STEAM ENGINES AND BOILERS, IRON COAL SHEDS.

Single and Telescopic Gasholders.

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A NEW SYSTEM OF BURNING GAS, BY WHICH ITS ILLUMINATING POWER IS MORE THAN TREBLE THAT OBTAINED BY ORDINARY METHODS.

To the Wenham Patent Lamp was awarded the Medal of the Sanitary Institute of Great Britain, 1884; Gold Medal of the International Inventors' Exhibition, 1885; also, the Highest Award at the Edinburgh Exhibition, 1886.

We now have on exhibition the largest display of Gas Lamps ever offered in this country, adapted to Stores, Halls, Banks, Dining and Drawing Rooms, Libraries, Billiard Rooms, etc.

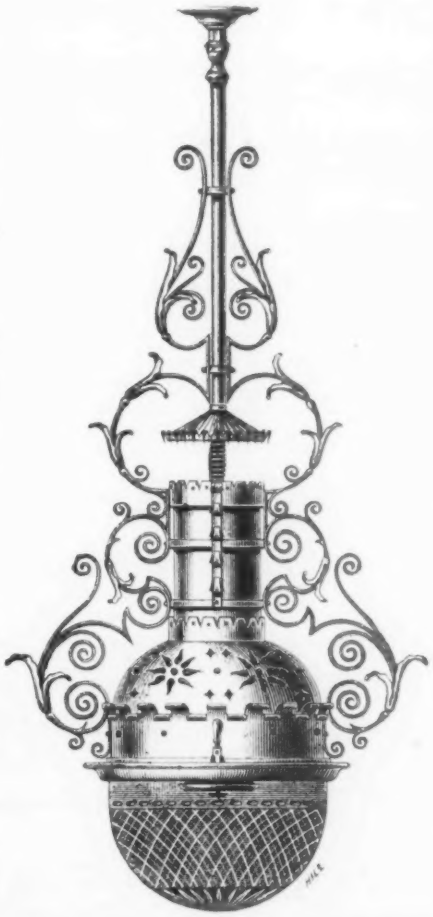
The **WENHAM LAMP** is the

PERFECTION OF GAS LIGHTING!

Dr. Wallace, Gas Examiner to the City of Glasgow, after an exhaustive test of this Lamp in comparison with others, remarks:

"The results from the Wenham Lamp largely exceed any that I have previously obtained from lamps constituted on the regenerative principle, and are enormously in advance of those obtained with any Gas Burner of ordinary construction."

This statement is fully corroborated by leading Gas Engineers, Managers of Gas Works, and large Consumers throughout the Continent, whose testimonials we have.



The advantages of the Wenham Lamp are—

IMMENSE ECONOMY IN THE CONSUMPTION OF GAS;

intensity, purity, softness, and steadiness of light; absence of downward shadow; security against fire (recommended by insurance companies for safety); and the most important auxiliary that Gas has yet secured to meet successfully, at a large reduction in cost, the use of Electricity as a popular illuminant.

We will be pleased to communicate with responsible parties desiring to secure exclusive territory for the sale of our Lamps.

THE U. S. WENHAM PATENT GAS LAMP CO.,

SHELDON MFG. CO., General Agents, 18 W. 23d St., N. Y. City.

THE ALBO-CARBON LIGHT!

The Perfection of Gas Lighting.

Producing the Highest Illumination yet obtained from Gas, and

EFFECTING A SAVING IN ITS CONSUMPTION.

It has been most effective in

Replacing Electricity,

AFFORDING A

SOFT WHITE LIGHT

of **EXTREME BRILLIANCY & POWER.**

It has been most successful in

Supplanting Kerosene,

Giving Increased Light, Less Heat, and Perfect Safety

WITHOUT ADDITIONAL COST.

NOTICE.—Suits are pending in the United States Circuit Courts in Illinois and Pennsylvania against various parties for infringement of our Letters Patent No. 247,925, dated October 4, 1881, and No. 333,862, dated Jauary 5, 1886. The first of these suits has come up for hearing, and an injunction has been granted therein. The second of said suits has not yet been reached for hearing. All persons are cautioned against manufacturing, selling, or using any apparatus or material which infringes our Patents. We intend to prosecute all parties infringing patents owned by us.

THE ALBO-CARBON LIGHT COMPANY, - - - NEWARK, N. J.

Sole Manufacturers for the United States.

DURING THE PAST YEAR, THE

NATIONAL GAS LIGHT AND FUEL CO.

218 LA SALLE ST., CHICAGO,

Have Erected Twelve Sets of Water Gas Generating Apparatus under the *Springer Cupola* System. They are as follows:

1886

Newton Illuminating Company, Newton, Kansas.— Daily capacity, 120,000 cu. ft.
Wellington Light & Heat Co., Wellington, Kansas.— Daily capacity, 120,000 cu. ft.
Chippewa Falls, Gas Light Co., Chippewa Falls, Wis.— Daily capacity, 120,000 cu. ft.
Elkhart Gas Light & Coke Co., Elkhart, Indiana.— Daily capacity, 120,000 cu. ft.
Madison City Gas Light Company, Madison, Wis.— Daily capacity, 120,000 cu. ft.
South Bend Gas Light Co., South Bend, Indiana.— Daily capacity, 250,000 cu. ft.
Sheboygan National Gas Comp'y, Sheboygan, Wis.— Daily capacity, 120,000 cu. ft.
Salina Gas Light Company, Salina, Kansas.— Daily capacity, 120,000 cu. ft.
Rathbun Company, Deseronto, Province Ontario.— Daily capacity, 80,000 cu. ft.
Jefferson City Gas Light Co., Jefferson City, Mo.— Daily capacity, 120,000 cu. ft.
Mankato Gas Light Company, Mankato, Minnesota.— Daily capacity, 80,000 cu. ft.
Minneapolis Gas Lt. & Coke Co., Minneapolis, Minn.— Daily capacity, 1,000,000 cu. ft.

1886

Kloenne & Bredel Improved
REGENERATIVE FURNACES
Self-Sealing Mouthpieces and Bridge Pipes,
RETORT HOUSES, WASHER-SCRUBBERS
GASHOLDERS, AND GAS WORKS COMPLETE.

Our system of heating retorts by regenerative furnaces is the simplest, most economical, most durable, and cheapest of any in use. It is the only regenerative furnace used to any extent in Great Britain, where several thousand retorts are working at the present time. In Birmingham alone 952 retorts were erected, and they are giving the best satisfaction ever obtained from any regenerative furnaces. The great advantages our benches have over all others are the following:

The generator and regenerator are independent of each other, so that any contraction or expansion of one will not interfere with the other.

The superheating surface is greater than in any other furnace yet constructed. The regenerator is absolutely self-tightening, and cannot get out of order.

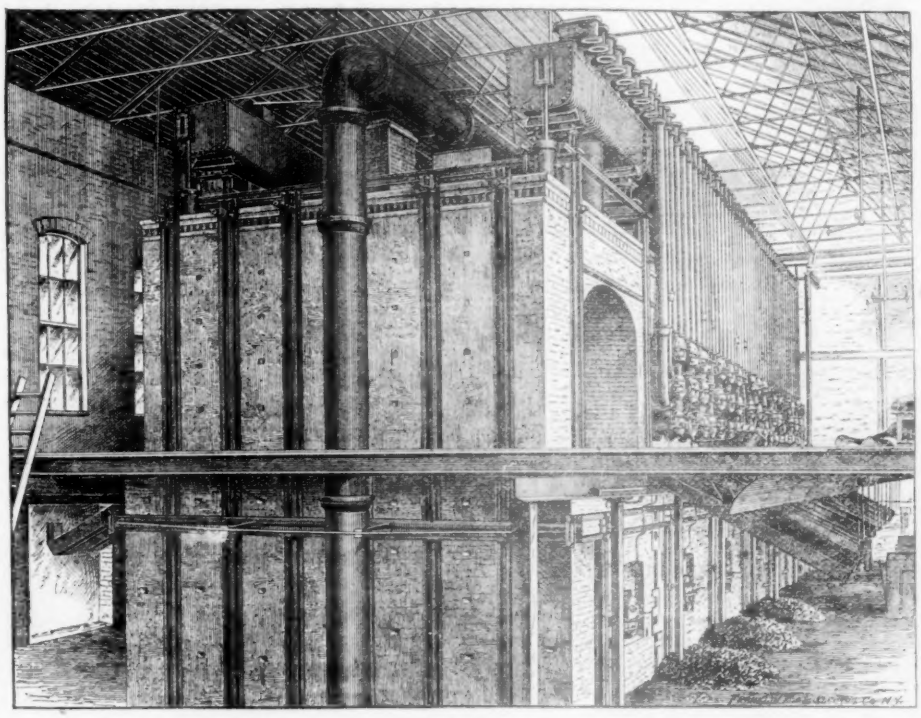
The thickness of material between the waste gases, secondary and primary air is only 1¼ inches, which increases the regenerative power from 100 to 500 per cent.

The generator is working absolutely cold, and therefore is not liable to any perceptible wear and tear.

The grate, having an enormous surface, allows the use of an inferior fuel, such as breeze, fine coke, or slack coal.

Clinkers are never formed. By an ingenious arrangement of mixing air and the steam produced by the cooling water all incombustible materials in the fuel are formed into soft ashes.

The waste gases go up through flues at 400° to 500° F. No large chimneys are required.



No cold air can enter; consequently no cracking of retorts.

The generator is inside of bench, thereby preventing any loss of heat; and stokers do not have to stand on a hot floor, as is the case where the generator projects outside of the bench.

In the past two years more than 500 retorts, with a capacity of five million cubic feet of gas per diem, have been erected in this country, and these are giving the best satisfaction, as the following testimonials will show.

We also construct half-regenerative benches, which will give the best results, and can be built in existing skeleton arches.

OFFICE OF THE NEWARK GAS LIGHT COMPANY, NEWARK, N. J., January 28, 1887.

MR. FREDERICK BREDEL, General Agent Kloenne Regenerative Furnace:

Dear Sir—The Kloenne Furnaces erected by you have been in continuous use for more than a year, and continue to give us satisfactory results. We are carbonizing 1,800 pounds coal per retort in 24 hours, and the average fuel consumption for this much has been 16.8 pounds by volume of the coke produced, or 100 pounds coal have been carbonized by 11.25 pounds hot coke. We have not lost a retort yet, and I think that those in use will give us six months' more service.

Very truly, [Signed] EUGENE VANDERPOOL.

ENGINEER'S OFFICE, MILWAUKEE GAS LIGHT COMPANY, MILWAUKEE, WIS., January 26, 1887.

FRED. BREDEL, C.E.: Dear Sir—Upon your request for a testimonial for publication, I am pleased to send you the following, as I consider it deserved for the way in which your contract was carried out with us. I would say to any in the profession that among all the plans of benches presented to me from which to select I chose the "Kloenne" for several reasons. I considered it perfect in principle, that at all times it would be under absolute control, and also that each block in the regeneration could be easily seen and repaired if necessary. Your work upon our benches was done as good as it possibly could have been by anyone, and such has been the opinion of the several visitors during the progress of the work and since its completion, without exception. We have been running the furnaces since Oct. 6, and as yet have observed no cracked or sagged retorts. Every part of the work appears as perfect as when set. Although the first month was used up in experimenting and learning how to run the furnaces, and since that time we have experienced very cold weather, yet we are *selling* 26 bushels of coke (40 lbs. per bushel) per net ton of coal used. The consumption of coke in the furnaces does not exceed 20 per cent. at the present season, and for the year I am sure will be materially less.

Yours truly, [Signed] E. G. COWDERY.

OFFICE OF THE CHICAGO GAS LIGHT AND COKE COMPANY, CHICAGO, ILL., January 27, 1887.

FRED. BREDEL, Esq.: Dear Sir—We have had eight benches of nines with the Kloenne furnaces running continuously for 13 months. The results have averaged 9,000 cubic feet per mouthpiece in 24 hours, with a fuel consumption of 13 pounds coke per 100 pounds coal carbonized.

Yours truly, [Signed] THEOB'D FORSTALL, *V.-P.*

For further information apply to

FRED. BREDEL,
332 East 17th Street, N. Y. City.
OR
C. F. KREISCHER,
132 Mangin Street, N. Y. City.

GAS ENGINES. GAS WORKS APPARATUS AND CONSTRUCTION.

THE CLERK GAS ENGINE CO.,

Main Office, 1012, 1014, 1016, 1018 Filbert St., Philadelphia, Pa.

WM. W. GOODWIN, Prest. E. STEIN, Sec. S. LEWIS JONES, Asst. Sec. A. J. DOTY, Supt.

The utility and convenience of the Gas Engine being no longer an open question, it only remains now for intending purchasers to select the BEST. We claim for the CLERK GAS ENGINE that it is equal to any other manufactured as regards steadiness in running, simplicity, and ease of keeping in repair, and that it gives the greatest amount of power for the least money (both in first cost and expense of running) of any engine made. In support of this claim we refer to the test of the Gas Engines made under the direction of the American Institute of New York, in December, 1885, and heretofore published in these columns. These engines are especially adapted for continuous running under heavy loads, and we can refer to Engines which have run 22 hours a day for months at a time.

Made in Sizes of 5, 10, 15, 20, and 25 Horse Power. All Engines Guaranteed for One Year.

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RUSTLESS Send for New Catalogue. RUSTLESS

The WELLS RUSTLESS IRON COMPANY,

Nos. 7 and 9 Cliff Street, New York City.

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Gas Companies and others about to erect Gasholders will find it profitable to consult W. C. WHYTE, who for over thirty years has made a specialty of

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Fifty tanks now in operation show the sort of work done. Address

W. C. WHYTE, No. 15 Cortlandt St., N. Y. City.

GAS vs. ELECTRIC LIGHT.

We would invite attention to the able and exhaustive argument of General A. Hickenlooper, President of the Cincinnati Gas Light and Coke Company, contained in a handsome pamphlet of 96 pages, entitled

"EDISON'S INCANDESCENT ELECTRIC LIGHTS FOR STREET ILLUMINATION. REPORT OF AN ARGUMENT DELIVERED BY A. HICKENLOOPER BEFORE THE COMMITTEE ON LIGHT, MUNICIPAL COUNCIL, CITY OF CINCINNATI, JULY 22, 1886."

This is a subject of special interest to all Gas Light Companies.

Prices.

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A sample copy will be sent by mail on receipt of 50 cts.

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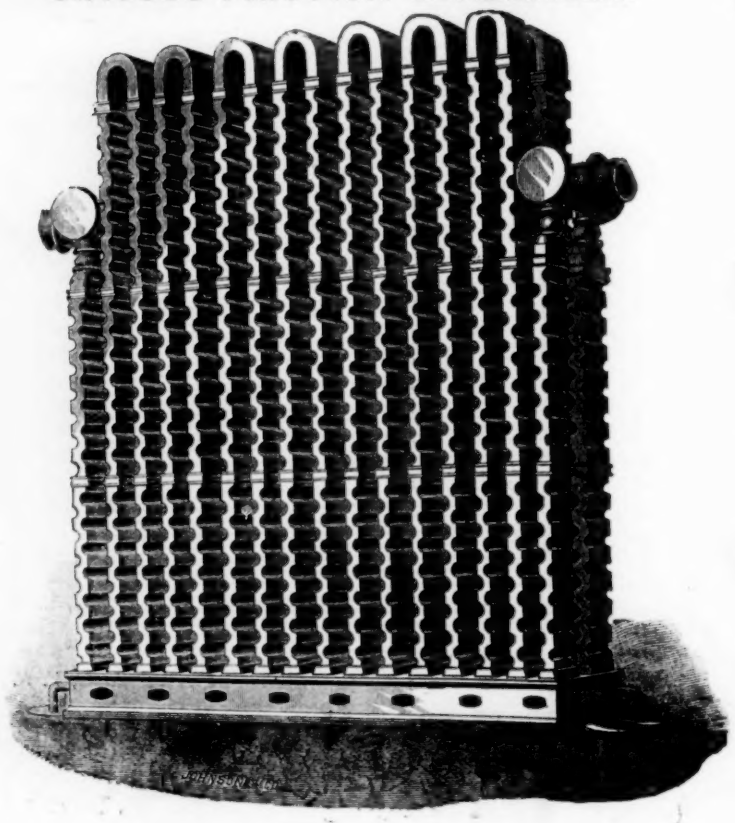
TRUSTEES AND AGENTS FOR THE

SINUOUS FRICTION CONDENSER.



We desire to draw the attention of the gas community to the merits of the SINUOUS FRICTION CONDENSER. Companies intending to introduce new condensers into their works will do well to confer with us and examine plans and estimates before contracting for any other pattern The FRICTION CONDENSER is now in use at the gas works located in the following places:

Portland, Me.	Brookline, Mass.	Pawtucket, R. I.	Fredericton, N. B.
Newport, R. I.	Chelsea, Mass.	Jamaica Plain, Mass.	St. John, N. B.
Gloucester, Mass.	Woburn, Mass.	Attleboro, Mass.	Paterson, N. J.
Newton & Watertown, Mass.	Peoria, Ill.	Calais, Me.	Dover, N. H.
	Clinton, Mass.	Fall River, Mass.	Waltham, Mass.

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Gas and Water Pipes,

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GAS AND WATER MACHINERY

OF THE MOST APPROVED PATTERN.

Also, Gasholders and Iron Roofing.

Orders from Gas and Water Companies promptly attended to.

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GAS EXHAUSTERS

Have long been regarded as "luxuries" not to be thought of by small companies; but

CONNELLY'S JET EXHAUSTER IS WITHIN THE REACH OF ALL!

Will Pay for Itself in Six Months! Saves Labor! Lengthens the Lives of Retorts! Prevents the Formation of Carbon! Increases the Yield from Twelve to Fifteen Per Cent.!

We find, after careful inquiry and investigation, that the majority of the Gas Works in the United States and Canada are running *without Exhausters*, which, in our opinion is due to two causes. *First.* The prices heretofore asked for Exhausters have been so high as to counteract, to a great extent, the advantages to be obtained from their use, and caused most managers to postpone their adoption indefinitely, or until their consumption had largely increased. *Second.* Many superintendents have a false impression that it will not pay to run an Exhauster in works producing less than 20,000 feet per day.

The first difficulty we overcome by selling our Exhausters at *extremely low prices*, as will readily be admitted after comparing our list with those of other manufacturers; and as to the second, we can say we have most convincing evidence from many companies operating our Exhausters that they can be used to advantage in works producing *as low as* 6,000 *cubic feet per day.*

In our improved Exhauster we combine the "Exhaust Tube" Gas and Steam Governors, Gas Compensator, and Bye-Pass Valves in the most compact form possible, which is a very great advantage to the machine, besides enabling us to manufacture and sell at the low prices given.

This is the only Exhauster in the market having a "compensator" in addition to the "gas governor"—a most important improvement, as it does away with all possible danger of their ever drawing air, and thus reducing the illuminating power of the gas.

FOR OIL GAS WORKS.

Our Exhausters are especially adapted for the use of Oil Gas Works; and where oil is required to dilute the gas a valve can be adjusted *to take the exact amount of air required*, thus dispensing with air pumps and their attendant labor and annoyance.

POINTS OF SUPERIORITY.

Requires *one-half the floor space* and *one-third less steam* than any other Exhauster in the market of same capacity. *More cheaply and easily connected*, as outside "Bye-Pass Valves" are dispensed with. It is the only Exhauster manufactured having "Compensator" and "Governor" *combined*, the "Compensator" with all other Exhausters being a separate and distinct machine. It is simple in construction, easily adjusted, not liable to get out of order, and *can be operated by ordinary workmen.*

NAPHTHALINE AND STEAM JET EXHAUSTERS.

As many superintendents of Gas Works believe the use of a Steam Jet Exhauster will inevitably cause trouble from *naphthaline* deposits, we recently sent out letters of inquiry to superintendents using our Steam Jet, asking for their experience, and the following replies speak for themselves. That naphthaline deposits are often unjustly attributed to Jet Exhausters is well known by many superintendents. When the cause cannot be determined it seems to be the rule to place the responsibility on the Jet Exhauster, *if they have one;* but if no Exhauster is used *the cause remains a mystery.*

OFFICE LISTOWEL GAS LT. CO., LISTOWEL, CAN., May 29, 1885.

Messrs. Connelly & Co., Ltd.: Gentlemen—The Exhauster purchased from you over three years ago, and now in use, has proven in every way all you claim for it, and has given us great satisfaction. No trouble has arisen from naphthaline.

Yours respectfully, F. W. HAY, Sec.

RICHMOND GAS CO., RICHMOND, KY, June 1, 1885.

Messrs. Connelly & Co., Ltd., 407 Broadway, N. Y.: Gentlemen—I put in your Steam Jet Exhauster last November. I think it a perfect machine, as it requires no attention whatever. Have not had any naphthaline to contend with; it would be very easy to get rid of that substance if I had it. Yours very truly, J. B. GORDON, Supt.

HAMPTON, VA., June 3, 1885.

Messrs. Connelly & Co., Ltd.: Gents—We have been using your Steam Jet Exhauster for the past 3 years, and have never had any trouble with it whatever, either from naphthaline or any other source. Yours truly, J. B. H. GOFF.

BRUNSWICK, ME., May 27, 1885.

Messrs. Connelly & Co., Ltd.: Dear Sirs—Your favor of 23d inst. at hand. In answer would say your Exhauster works well with us. We make an oil gas; are not troubled with naphthaline. Very truly yours, B. G. DENNISON, Prest. Brunswick Gas Lt. Co.

WILMINGTON, O., June 15, 1885.

Messrs. Connelly & Co., Ltd.: Dear Sirs—We started your make of six-inch Steam Jet Exhauster March 30, and I am pleased to state, from the time the steam was turned on, it has performed its work to our entire satisfaction. We have never had any other but a Steam Jet Exhauster, and have never been troubled with naphthaline. For many reasons I prefer it to the "rotary," and have no hesitancy in recommending it.

Yours truly, E. W. HAMLIN, Sec. Gas Co.

OFFICE LOGAN GAS LT. & COKE CO., LAGAN, HOCKING CO., O., May 29, 1885.

Connelly & Co., Ltd.: Gentlemen—In answer to yours of 27th we have to say that the Steam Jet Exhauster put in for us by you last fall has been used constantly since, and, up to this time, we have had no trouble with naphthaline. We have heard many gas men say that a Steam Set Exhauster is liable to bring on trouble with naphthaline, and we have had that fear before us; but so far we have escaped, and we trust we may not have any experience with that gas manager's bugbear. Yours truly,

LOGAN GAS LT. & COKE CO.

OFFICE ATHENS GAS LT. CO., ATHENS, O., May 30, 1885.

Messrs. Connelly & Co., Ltd.: Dear Sirs—We take pleasure in giving you an unqualified endorsement of your Steam Jet Exhauster. It has been in place almost a year; been tested in all seasons and under all conditions; it has always proved true to the work assigned it. We have had no naphthaline deposit, nor any trouble chargeable to the Exhauster. Nothing but good has come from it, and *great* good at that. We can't do without it. Very truly yours, C. H. WELCH, Supt.

OFFICE MEADVILLE GAS WORKS, MEADVILLE, PA., May 29, 1885.

Connelly & Co., Ltd.: Gents—Yours of the 27th received and contents noted. Would say that after using your Steam Jet Exhauster for the past 18 months, find it perfectly satisfactory in every way. So far as naphthaline is concerned, we have had no trouble whatever as yet. Yours, GEO. S. CULLUM, Supt.

NYACK AND WARREN GAS LT. CO., NYACK, N. Y., May 25, 1885.

Connelly & Co., Ltd.: Gentlemen—Since your Jet Exhauster has been here there has been no trouble, and certainly *no naphthaline.* The only trouble I have experienced was the Jet becoming clogged with tar last week, and I cleaned it in a few minutes. It has run over three years without any trouble or cost for repairs. Yours truly,

A. MURRAY, Lessee and Manager.

OFFICE CADIZ GAS LT. CO., CADIZ, O., May 29, 1885.

Messrs. Connelly & Co., Ltd.: Gentlemen—Yours of 22d, inquiring how our Steam Jet Exhauster is doing, has been received. We have been using one of your Exhausters about four years, and with the best of satisfaction. We have less trouble with carbon in retorts, make more gas from same amount of coal than before, and have no trouble with stoppage in pipes or trouble from tar; and as regards naphthaline, we are not troubled with it, and do not know what it is to have any stoppage in pipes from naphthaline.

Very truly yours, A. N. HAMMOND, Sec.

SIDNEY (OHIO) GAS WORKS, June 1, 1885.

Connelly & Co., Ltd.: Gentlemen—We have now been using one of your Steam Jet Exhausters about five months, and thus far it has given us perfect satisfaction. We get a better yield and a more brilliant quality of gas from the coal. We have seen in papers and heard from different individuals that Steam Jet Exhausters were productive of naphthaline. "*We can't see it,*" as we have found no trace of it in the works, mains, services, or meters. Respectfully yours, W. W. GRAHAM, Supt.

CONNELLY & CO., LTD., No. 177 Broadway, New York City.

T. C. HOPPER'S
AUTOMATIC DIFFERENTIAL GAS GOVERNOR

Is now in Practical Operation, doing Perfect Automatic Service with Great Precision.

This Governor will do all and more than any other Governor on the Market.

BE SURE TO THOROUGHLY INVESTICATE THE SUPERIOR MERITS OF THIS GOVERNOR BEFORE PURCHASING.

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GLOBE LAMPS.

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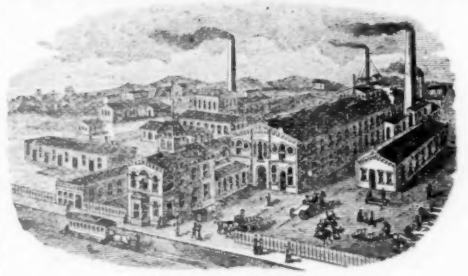

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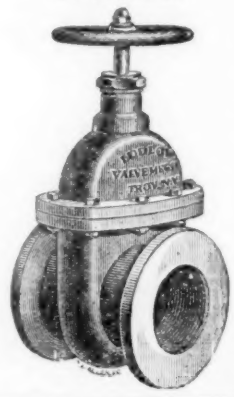

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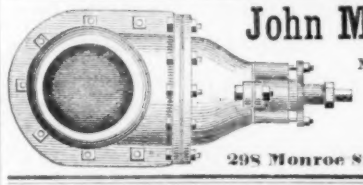

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LIGHT, HEAT, AND POWER.

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Fitted with the new Incandescent Gas Fire.

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Fitted with Illuminating Burners and Copper Reflectors.

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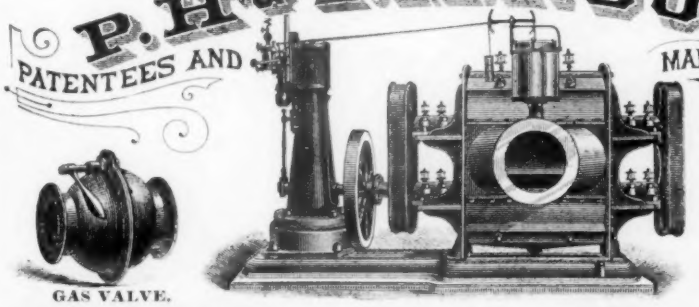

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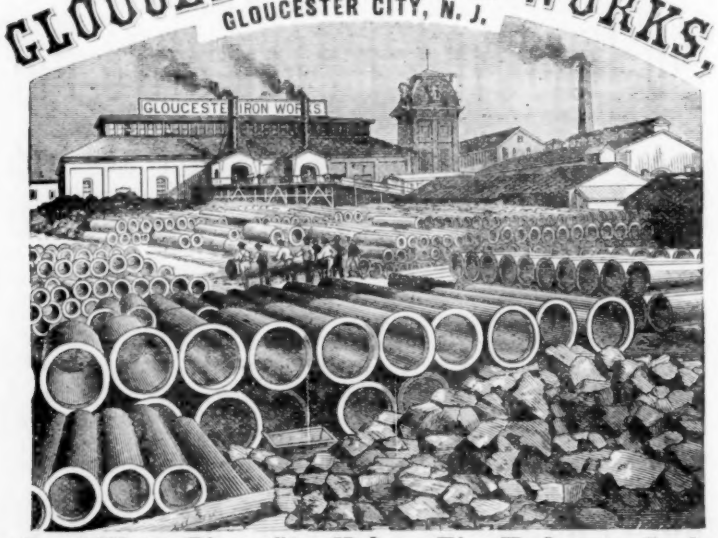

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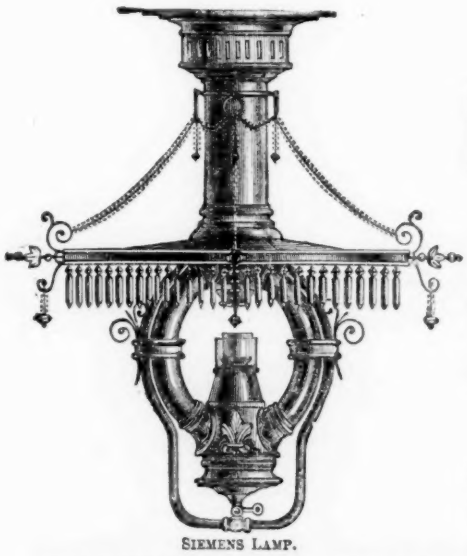

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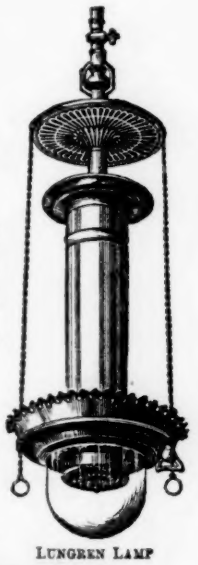

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NEWARK, ENGLAND	350,000	"	BRIDGEPORT, U. S.	500,000	"
BUFFALO, U. S. (MUTUAL)	500,000	"	TORONTO, CANADA	1,000,000	"
BERLIN, GERMANY	1,250,000	"	HARTFORD, U. S.	1,000,000	"
SO. BRISBANE, AUSTRALIA	300,000	"	DETROIT, U. S.	750,000	"
LEEDS, ENGLAND	2,600,000	"	SINGAPORE, CEYLON	300,000	"
FURTH, GERMANY	400,000	"	BRUNSWICK, GERMANY	300,000	"
FREIBURG, GERMANY	200,000	"	LILLE, FRANCE	750,000	"
NINE ELMS, LONDON	3,000,000	"	CADIZ, SPAIN	300,000	"
MELBOURNE, AUSTRALIA (2)	3,000,000	"	READING, ENGLAND	2,000,000	"
GLUCKAUF COKE WORKS, GERMANY.	200,000	"	LINCOLN, U. S.	250,000	"
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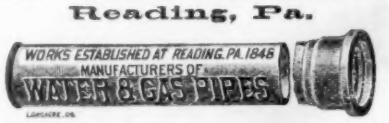

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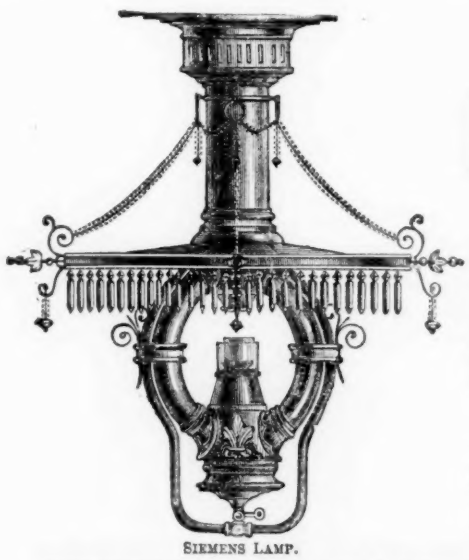

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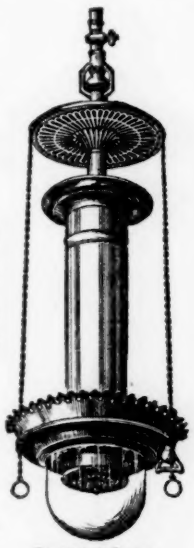

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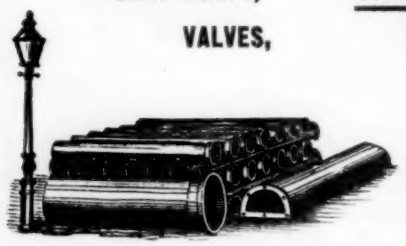

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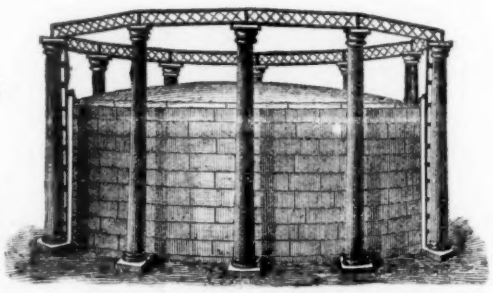

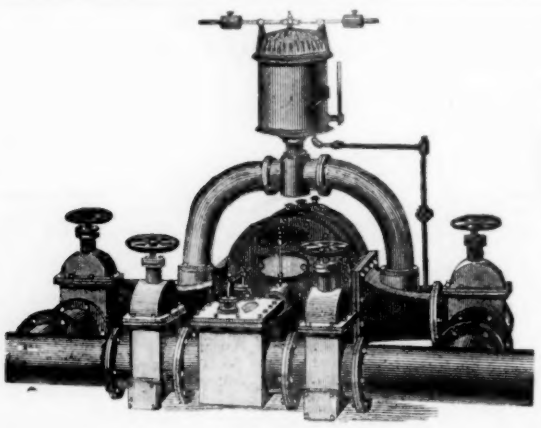

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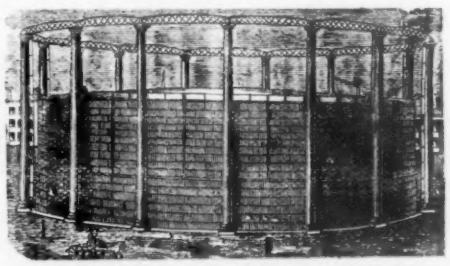
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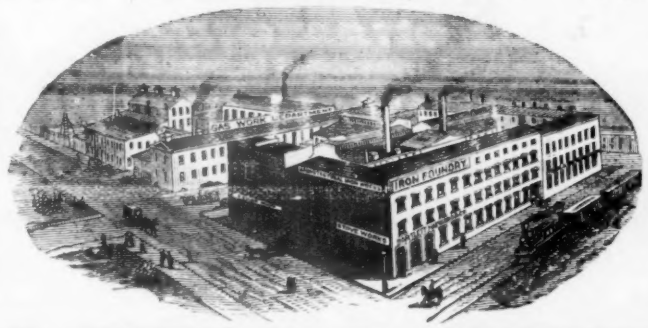

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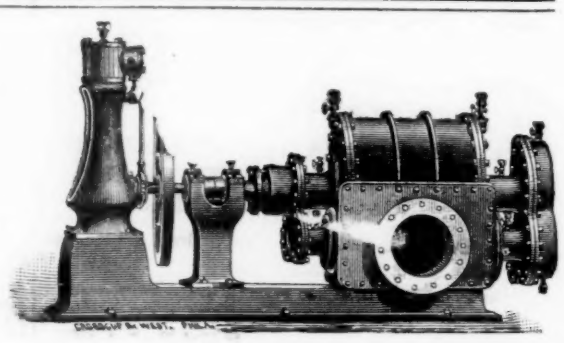

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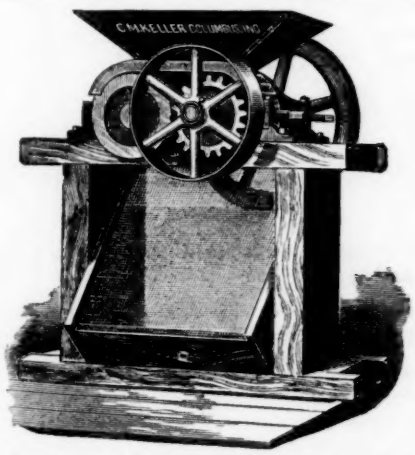

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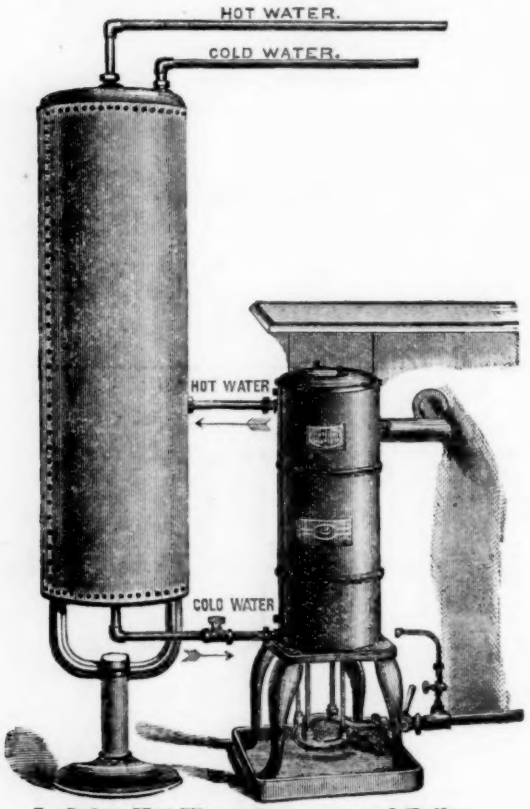

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Safety Hot Water Generator and Boiler.

Cut I. represents our Safety Gas Hot Water Generator and Boiler, arranged for home use. This most easy, quick, and economical way of preparing a warm bath, or for heating water for any omestic purpose, entirely supersedes any necessity for the use of ranges or stoves—a great comfort, particularly in hot weather. The boiler being self-filling, as the hot water is drawn off, can never become empty, thus preventing the possibility of any accident.

We beg to call attention to the cast iron pan which is now attached to the legs of the Generator (see illustration). This is to catch the drippings from the Coil, which many persons suppose come from a leak, when in fact they are produced by condensation. This condensation is cause by he hot flame coming in contact with the coil filed with cold water.

New Style Gas Cooking Stove.

Cut II. represents our New Style Cooking Stove. As will be seen, it has an ornamented cast iron base and front, and extension shelves. The oven burner, which is atmospheric (unless otherwise ordered), is of an entirely new and improved pattern (patent applied for). The ovens are of greater capacity than those of the old style. The top, in conjunction with the outlet pipe, is designed to carry off all products of combustion; hence the outlet pipe must be connected with a flue, or the stove will not work properly.

This Stove has 4 boiling burners in top of hot plate. All fittings are nickel plated. We are making this style of Cooking Stove in the following sizes—viz., No. 7 B, No. 8 B, No. 9 B, and No. 10 B.

III.—Improved Hot Plate, No. 108.

New Style Hot Plates.

Cut 11. represents our New Style of Hot Plates, of which we are making No. 106 (two small boiling burners), No. 107 (two medium sized oiling burners), and No. 108 (two medium and one large boiling burner). See new Catalogue and Price List for further particulars.